



Maintenance **A**ccountability **P**rocess

Workbook

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Washington State Department of Transportation
Maintenance Office

MAINTENANCE ACCOUNTABILITY PROCESS Workbook

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MAINTENANCE ACCOUNTABILITY PROCESS

Workbook

Tool Box

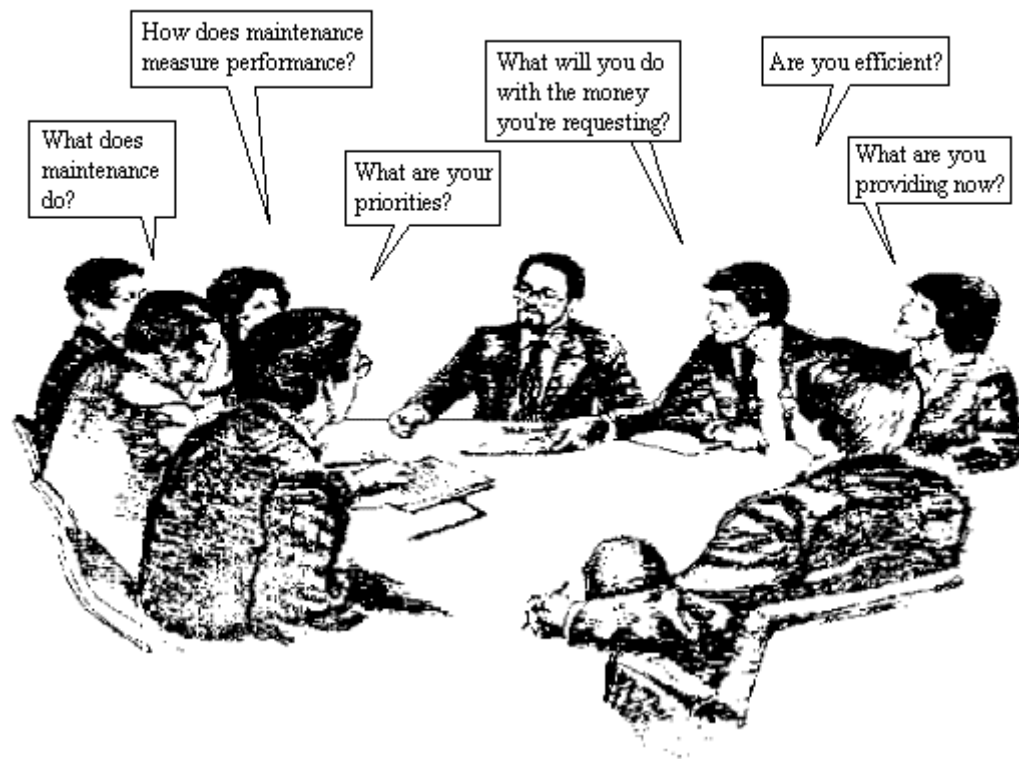
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TAB 1

Introduction To The Maintenance Accountability Process

Questions About Highway Maintenance



History & Background

Consultant Study

In 1995 the Washington State Department of Transportation hired a consulting team to evaluate its maintenance program in the areas of performance measurement, program efficiency, program management, and communications. The need for this study was born out of frustration that developed during the 1995 Legislative session when legislators struggled to understand management and operation of the maintenance program, and WSDOT staff struggled to provide effective responses to requests concerning the impacts on the statewide program of numerous budget scenarios.

The consultant study was completed in June of 1996 and recommended that WSDOT implement a Maintenance Accountability Process, or MAP for short. The MAP is a comprehensive planning, managing, measuring and communication process for management of the state highway maintenance program. The MAP, through its component pieces, is intended to provide a clear link between maintenance objectives, maintenance activities, maintenance service levels, the budget, and actual performance.

MAP & The Quality Program

During this same time WSDOT was initiating a department wide Quality program. Elements of the MAP parallel, and are consistent with the department Quality initiative. Quality elements of customer focus, performance measurement, and continuous improvement are an integral part of the MAP. WSDOT was able to meld the two processes to insure that implementation of the MAP was within the context of the department Quality program.

The MAP, in concept, parallels the Quality Blue Print and also consists of a 7 step continuous improvement cycle:

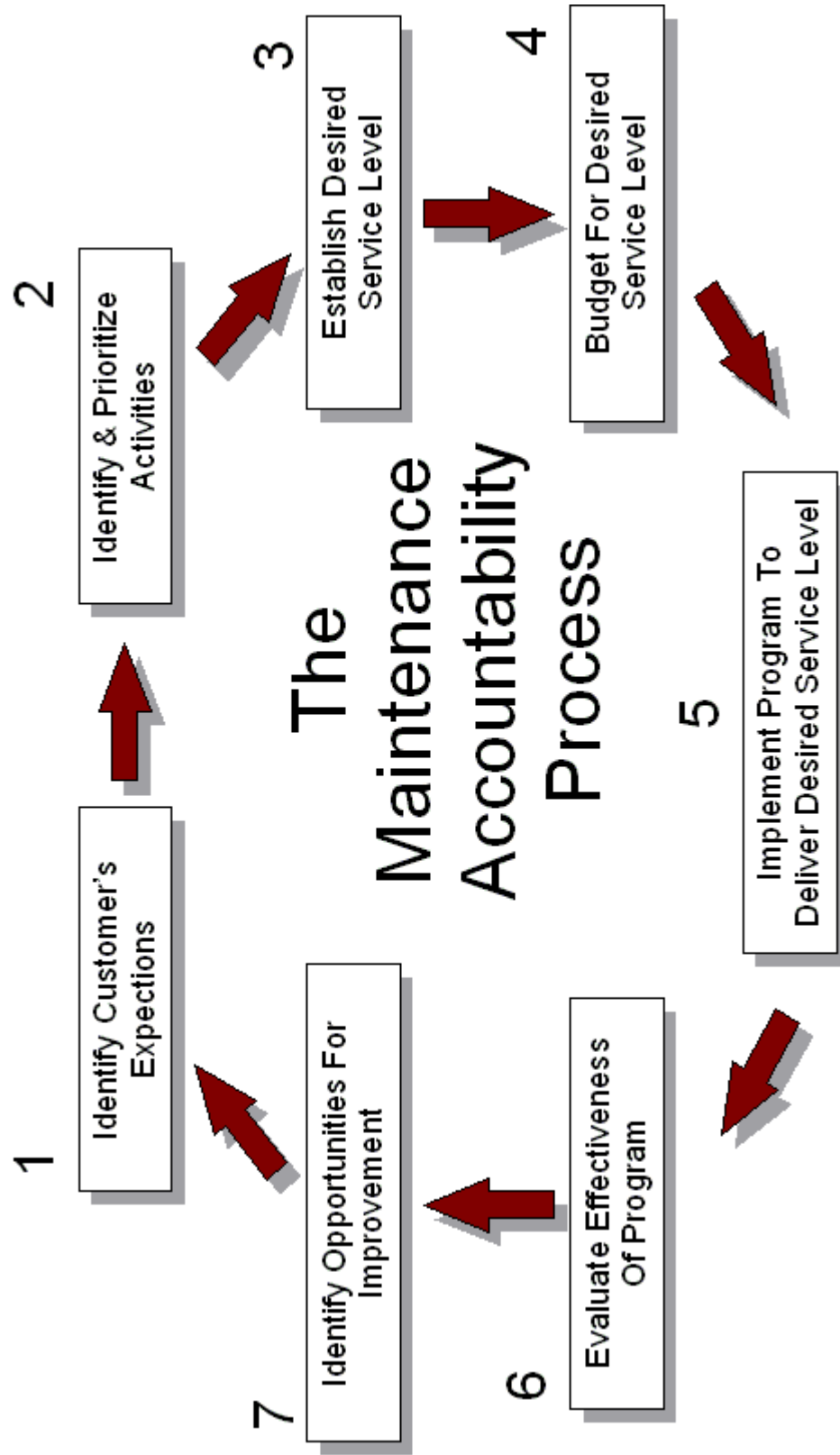
1. Identify customer expectations
2. Identify and prioritize activities
3. Establish a desired service level (SL)
4. Budget for desired service level (SL)
5. Implement the program to deliver desired SL within budget
6. Evaluate the effectiveness of the program
7. Identify opportunities for improvement

Once the process reaches step 7 it repeats itself in a never ending cycle.

MAP Implementation

WSDOT has developed several tools needed to implement the Maintenance Accountability Process. One of the most important is a Service Level Investment Model with maintenance activities that are easily understood, and clearly linked to outcome performance measures. Five service levels are established for each maintenance activity, A through F with A being the best or highest service level and F being the worst. The model also includes costs for delivering each of these five service levels to facilitate budget tradeoff decisions. Elements of the infrastructure are monitored for maintenance activity and can be measured and evaluated through statistically valid field sampling techniques to determine the effectiveness of the program. Over time, the condition of the infrastructure can be plotted and trends identified.

Implementation of the MAP will provide WSDOT the means to clearly communicate to it's key customers, the Legislature, the Governor, the Transportation Commission, and ultimately the tax paying public, the impact of policy and budget decisions on program service levels.



TAB 2

What Does Maintenance Do?

M PROGRAM

HIGHWAY MAINTENANCE AND OPERATIONS

M1 - Maintenance Management and Support

All expenditures of an administrative or supervisory nature that are directly related to maintenance of highways and capital plant facilities and are of such a nature they cannot be readily distributed to specific maintenance projects.

M2 - Maintenance - On State System

All expenditures for activities related to operation, maintenance and repair of the roadway and associated facilities in order to provide safe, reliable, and pleasant movement of people and goods.

M5 - Inventory and Stores Administration

All expenditures for operation and administration of the storage of necessary materials and supplies for maintenance except signs and stock piled sand and gravel. Items include such items as traffic signal parts, illumination parts, traffic cones and herbicides.

Maintenance (M2) Program Structure (Simplified)

Group 1 - Roadway Maintenance & Operations

A - Roadway Maintenance

- 1A1 - Pavement Patching & Repair
- 1A2 - Crack Sealing & Chip Seals
- 1A3 - Shoulder Maintenance
- 1A4 - Sweeping & Cleaning
- 1A5 - Miscellaneous Roadway Maintenance

B - Roadway Operations

- 1B1 - Safety Patrol

Group 2 - Drainage Maintenance & Slope Repair

A - Drainage Maintenance

- 2A1 - Grade & Clean Ditches
- 2A2 - Maintain Culverts
- 2A3 - Maintain Storm Drainage Systems
- 2A4 - Maintain Silt Drainage Systems
- 2A5 - Miscellaneous Drainage Maintenance

B - Slope Repair

- 2B1 - Slope Repairs

Group 3 - Roadside & Landscape Maintenance

A - Roadside Maintenance

- 3A1 - Litter Pickup
- 3A2 - Noxious Weed Control
- 3A3 - Nuisance Vegetation Control
- 3A4 - Control of Vegetation Obstructions
- 3A5 - Miscellaneous Roadside Maintenance

B - Landscape Maintenance

- 3B1 - Landscape Maintenance

Group 4 - Bridge & Tunnel Maintenance

A - Bridge Maintenance

- 4A1 - Bridge Deck Repair
- 4A2 - Structural Bridge Repair
- 4A3 - Bridge Cleaning
- 4A4 - Miscellaneous Bridge Maintenance

B - Bridge Operations

- 4B1 - Operation of Movable Bridges
- 4B2 - Operation of Keller Ferry

C - Urban Tunnel Maintenance

- 4C1 - Urban Tunnel Maintenance

Group 5 - Snow & Ice Control

A - Snow & Ice

- 5A1 - Snow & Ice Control

Group 6 - Traffic Services

A - Traffic Control & Safety Maintenance

6A1 - Pavement Striping
6A2 - Raised Pavement Markers (Buttons)
6A3 - Pavement Marking
6A4 - Repair/Replace Regulatory Signs
6A5 - Repair/Replace Advisory Signs
6A6 - Repair/Replace Guideposts
6A7 - Guardrail Maintenance
6A8 - Traffic Signal Maintenance
6A9 - Highway Lighting Maintenance
6A10 - Surveillance Control & Driver
Information (SC & DI) Safety Device
Maintenance

B - Permits

6B1 - Issuing Oversize-overweight Permits

Group 7 - Rest Area Maintenance

A - Rest Area Maintenance

7A1 - Rest Area Maintenance

Group 8 - Supervision, Training, & Support Maintenance

A - Field Crew Supervision

8A1 - Field Supervision

B - Employee Technical/ Safety Training & Meetings

8B1 - Training & Meetings

C - Support Maintenance

8C1 - Support Maintenance

Group 9 - 3rd Party Damages & Disaster Maintenance

A - 3rd Party Damages

9A1 - 3rd Party Damages & Repairs

B - Disaster Maintenance

9B1 - Disaster Maintenance

Crosswalk Of Simplified Program Structure To Current Work Operation Numbers

Group 1 - Roadway Maintenance & Operations

A -Roadway Maintenance

1A1 PAVEMENT PATCHING & REPAIR

- 1111 MECHANICAL-PREMIX PATCH
- 1112 HAUL MIX - PATCHING OPERATIONS
- 1122 MANUAL -PREMIX SPOT PATCH
- 1128 MACHINE -PREMIX PATCH
- 1133 FULL DEPTH PATCH-ASPHLT/ASPHLT
- 1134 FULL DEPTH PATCH-ASPHLT/ASPHLT
- 1135 PATCH POT HOLES-HAND SPRD/TRK
- 1136 PREMIX PREPARATION-MIX W/MOTOR
- 1137 PCC PATCHING
- 1154 PATCHING & SUBGRADE REPAIR
- 1155 HAND SNIWEY PATCHING
- 1173 EROSION & SETTLEMENT REPAIRS
PRORATED COSTS

1A2 CRACK SEALING & CHIP SEALS

- 1147 SEAL COAT PATCHING
- 1148 HAUL MATERIAL FOR SEAL COAT
- 1153 FOG SEAL
- 1161 CRACK & JOINT SEAL-BITUM SURF
- 1162 EDGE CRACK SEALING ON PCC SURF
PRORATED COSTS

1A3 SHOULDER MAINTENANCE

- 1142 GRADE / SHAPE
- 1175 RESIDUAL HERBICIDE APPLICATION
PRORATED COSTS

1A4 SWEEPING & CLEANING

- 1181 MECHANICAL SWEEPING
- 1182 HAUL FOR SELF-DUMPING SWEEPERS
- 1183 HAND SWEEP-ISLANDS,INTERSECTNS
- 1184 SURFACE FLUSHING
- 1186 CLEAN UNDR GUARDRLS/ATTENUATORS
- 1187 SWEEP - TRACTOR MOUNTED SWEEPR
PRORATED COSTS

1A5 MISC. ROADWAY MAINTENANCE

- 1141 MAINT GRAVEL ROADS-MOTOR GRDR
- 1143 HAUL MATERIAL FOR GRAVEL ROADS
- 1172 PAVEMENT (ASPHALT) BURNING
- 1174 SAND BLEEDING SEALS
- 1176 REPAIR ASPHALT & CONCRETE CURB
- 1194 DESIGN,LOC,CONSTR ENGR - PROJS
PRORATED COSTS

B - Roadway Operations

1B1 SAFETY PATROL

- 1185 SECTION & / OR ROCK PATROL
PRORATED COSTS

COSTS PRORATED TO OTHER ACTIVITIES IN THIS GROUP

- 1101 PAYMENT TO CONTRACTOR
- 1102 TRAVEL PER DIEM
- 1103 EQUIPMENT RENTAL
- 1104 FACILITY ENERGY COSTS
- 1105 PERSONAL SERVICE CONTRACTS
- 1106 GOODS & SERVICES
- 1108 CAPITALIZED & NON CAPITALIZED EQUIP.
- 1191 CHG & INSTALL ATTACHMTS & MOVE
- 1195 FLAGGING
- 1199 OTHER WORK NOT COVERED 1111 >

Group 2 - Drainage Maintenance & Slope Repair

A - Drainage Maintenance

2A1 GRADE & CLEAN DITCHES

1311 DITCHING W MOTOR GRADER ONLY
1312 DITCHING W MOTOR GRDR & SUPPRT
1313 DITCHING W FRONTEND LOADR/BACK
1314 DITCHING W HYDR/PWR SHOVEL/CLM
1315 HAUL FOR DITCHING OPERATIONS
1329 CHANNEL CLEANUP
0900 PRORATED COSTS

2A2 MAINTAIN CULVERTS

1331 INSPEC MAINT CULVERTS/CROS DRN
0900 PRORATED COSTS

2A3 MAINTAIN STORM DRAINAGE SYSTEMS

1341 REPR MAINT MANHOLES/CATCH BASN
0900 PRORATED COSTS

2A4 MAINTAIN SILT DRAINAGE SYSTEMS

1343 REPR MAINT SILT BASNS/IRRIG FL
0900 PRORATED COSTS

2A5 MISC. DRAINAGE MAINTENANCE

1320 VEGETATION CONTROL W HERBICIDE
1394 DESIGN,LOC,CONSTR ENGR - PROJS
PRORATED COSTS

COSTS PRORATED TO OTHER 2A ACTIVITIES IN THIS GROUP

1301 PAYMENTS TO CONTRACTOR
1302 TRAVEL PER DIEM
1303 EQUIPMENT RENTAL
1304 FACILITY ENERGY COSTS
1305 PERSONAL SERVICE CONTRACTS
1306 GOODS & SERVICES
1307 CAPITALIZED OUTLAY-EQUIPMENT
1391 CHANGE AND INSTALL ATTACHMENTS
1395 TRAFFIC CONTROL
1399 OTHER WORK NOT COVERED 1311 >

B - Slope Repair

2B1 SLOPE REPAIR

1201 PAYMENTS TO CONTRACTOR
1202 TRAVEL PER DIEM
1203 EQUIPMENT RENTAL
1204 FACILITY ENERGY COSTS
1205 PERSONAL SERVICE CONTRACTS
1206 GOODS & SERVICES
1207 CAPITALIZED OUTLAY-EQUIPMENT
1211 REPAIRS RESHAPE SLOPES & SLIDES
1214 REPLACE REPAIR AND MAINTAIN FENCE
1291 CHANGE AND INSTALL ATTACHMENTS
1295 TRAFFIC CONTROL
1299 OTHER WORK NOT COVERED 1211>1298

Group 3 - Roadside & Landscape Maintenance

A - Roadside Maintenance

3A1 LITTER PICKUP

1671 ROADKILL/ANIMAL DISPOSAL
1672 MAJOR LITTER PICK-UP
1673 ROUTINE LITTER PICK-UP
1674 PICK-UP LITTER BAGS ONLY
1675 ADOPT A HIGHWAY ADMINISTRATION
0900 PRORATED COSTS

3A2 NOXIOUS WEED CONTROL

1616 NOXIOUS WEED-BIOLOGICAL CONTRL
1617 NOXIOUS WEED-POWER SPRAYING
1618 NOXIOUS WEED-CHEMICAL CONTROL
1619 NOXIOUS WEED-HAND
1674 PICK-UP LITTER BAGS ONLY
1616 NOXIOUS WEED-BIOLOGICAL CONTRL
10% 1653 POWER MOWING-UP TO 72 INCH SWATH
10% 1654 POWER MOWING-UP OVER 72 INCH SWATH
0900 PRORATED COSTS

3A3 NUSIANCE VEGETATION CONTROL

30% 1611 POWER SPRAYING
30% 1613 SOLID CHEMICAL WEED CONTROL-HAND
30% 1614 LIQUID CHEMICAL WEED CONTROL - HAND
30% 1622 POWER SPRAYING FOR BRUSH
25% 1625 CUTTING & DISPOSAL OF DEBRIS
25% 1626 POWER MOWING FOR BRUSH
30% 1636 BIOLOGICAL,CHEM,CULTURAL,MECH
25% 1653 POWER MOWING-UP TO 72 INCH SWATH
25% 1654 POWER MOWING-UP OVER 72 INCH SWATH
0900 PRORATED COSTS

3A4 CONTROL OF VEGETATION OBSTRUCTIONS

70% 1611 POWER SPRAYING
70% 1613 SOLID CHEMICAL WEED CONTROL-HAND
70% 1614 LIQUID CHEMICAL WEED CONTROL - HAND
70% 1622 POWER SPRAYING FOR BRUSH
75% 1625 CUTTING & DISPOSAL OF DEBRIS
70% 1626 POWER MOWING FOR BRUSH
100% 1628 DANGER TREE REMOVAL
70% 1636 BIOLOGICAL,CHEM,CULTURAL,MECH
65% 1653 POWER MOWING-UP TO 72 INCH SWATH
65% 1654 POWER MOWING-UP OVER 72 INCH SWATH
0900 PRORATED COSTS

3A5 MISC. ROADSIDE MAINTENANCE

1641 GRASS,TREES,SHRUBS,GRD COVER
1651 FERTILIZING,LIMING,REPLACE MUL
1683 REPAIR MAINT OF PATHS & TRAILS
1684 REPAIR MAINT OF PARK & RIDE LT
1685 REPAIR MAINT OF VIEWPTS & HIST
1694 DESIGN,LOC,CONSTR ENGR - PROJS
0900 PRORATED COSTS

B - Landscape Maintenance

3B1 LANDSCAPE MAINTENANCE

1501 PAYMENT TO CONTRACTOR
1502 TRAVEL PER DIEM
1503 EQUIPMENT RENTAL
1504 FACILITY ENERGY COSTS
1505 PERSONAL SERVICE CONTRACTS
1506 GOODS & SERVICES
1507 CAPITALIZED & NON-CAP OUTLAYS
1511 POWER SPRAYING
1512 HAND WEEDING
1513 SOLID CHEMICAL WEED CTRL-HND
1514 LIQUID CHEMICAL WEED CTRL-HND
1516 NOXIOUS WEED- BIOLOGICAL CONTROL
1517 NOXIOUS WEED-POWER SPRAYING
1518 NOXIOUS WEED-CHEMICAL CONTROL
1519 NOXIOUS WEED-HAND
1525 CUTTING & DISPOSAL OF DEBRIS
1526 PRUINING/SELECT THINNING TREES
1536 BIOLOGICAL,CHEM,CULTURAL,MECH/INSECTS
1541 GRASS,TREES,SHRUBS,GRD COVER
1551 FERTILIZING,LIMING,REPLACE MUL
1552 HAND MOWING-EDGING,TRIM',RAKE, & THATCH
1553 POWER MOWING-UP TO 72 INCH
1554 POWER MOWING-OVER 72 INCH
1561 OP OF SYSTEMS-MAINT,REPR,TEST
1573 LITTER PICK-UP/EMPTY CONTAINRS
1591 CHANGE & INSTALL ATTACHMENTS
1594 DESIGN, LOCATION AND CE FOR M2 PROJECTS
1595 TRAFFIC CONTROL
1599 OTHER WORK NOT COVERED 1511 >

COSTS PRORATED TO OTHER 3A ACTIVITIES IN THIS GROUP

1601 PAYMENT TO CONTRACTOR
1602 TRAVEL PER DIEM
1603 EQUIPMENT RENTAL
1604 FACILITY ENERGY COSTS
1605 PERSONAL SERVICE CONTRACTS
1606 GOODS & SERVICES
1607 CAPITALIZED & NON-CAP OUTLAYS
1691 CHANGE & INSTALL ATTACHMENTS
1695 TRAFFIC CONTROL
1699 OTHER WORK NOT COVERED 1611 >

Group 4- Bridge & Tunnel Maintenance

A - BRIDGE MAINTENANCE

4A1 BRIDGE DECK REPAIR

- 1936 ROADWAY DECK REPAIR
- 0900 PRORATED COSTS

4A2 STRUCTURAL BRIDGE REPAIR

- 1932 REMOVE DEBRIS - UNDER BRIDGES
- 1941 REPAIR MAINT-BRIDGE APPURTNS
- 1942 STRUCTURAL REPAIR & MAINT
- 1953 REPAIR BRIDGE EXPANSION JOINTS
- 0900 PRORATED COSTS

4A3 BRIDGE CLEANING

- 1922 CLEAN SURF/SIDEWALK-MECH. SWPR
- 1923 CLEAN SURF/SIDEWALK-FLUSHING
- 1925 CLEAN SURF/SIDEWALK-HAND
- 1926 CLEAN STRUCTURES-SANDBLASTING
- 1927 CLEAN STRUCTURES-STEAM,CHEM,HP
- 1928 CLEAN DRAINS - HAND
- 1931 CLEAN DRAINS - MECH METHODS
- 0900 PRORATED COSTS

4A4 MISC. BRIDGE MAINTENANCE

- 1915 PUMP WATER FR PONTOON CELLS
- 1916 ANCHOR CABLE TENSION-FL BRDGS
- 1994 DESIGN,LOC,CONSTR ENGR - PROJS
- 1933 PAINT STEEL STRUCTURE,APPURTNS

COSTS PRORATED TO OTHER 4A ACTIVITIES IN THIS GROUP

- 1901 PAYMENT TO CONTRACTOR
- 1902 TRAVEL PER DIEM
- 1903 EQUIPMENT RENTAL
- 1904 FACILITY ENERGY COSTS
- 1905 PERSONAL SERVICE CONTRACTS
- 1906 GOODS & SERVICES
- 1907 CAPITALIZED 7 NON-CAP OUTLAYS
- 1921 INSPECTION
- 1991 INSTALL ATTACHMENTS
- 1992 EXCESSIVE CREW TRAVEL>40-1 WAY
- 1995 FLAGGING
- 1999 OTHER WORK NOT COVERED 1911>

B - BRIDGE OPERATIONS

4B1 OPERATION OF MOVEABLE BRIDGES

- 1956 ELECTRICAL MAINT
- 1957 HYDRAULIC & WATER SYS MAINT
- 1980 OP OF MOVABLE BRIDGES-ROUTINE
- 1981 OP OF MOVABLE BRIDGES-MAINT
- 1982 OP OF MOVABLE BRIDGES-STORM WH

4B2 KELLER FERRY

- 2804 FACILITY ENERGY COSTS
- 2806 GOODS & SERVICES
- 2807 CAPITALIZED OUTLAY-EQUIPMENT
- 2880 OPERATION OF FERRIES
- 2881 REPAIR/MAINT OF FERRIES
- 2882 REPAIR/MAINT OF FERRIES FACILITIES

C - URBAN TUNNEL MAINTENANCE

4C1 URBAN TUNNEL SYSTEM MAINTENANCE

- 3201 PAYMENT TO CONTRACTOR
- 3202 TRAVEL PER DIEM
- 3203 EQUIPMENT RENTAL
- 3204 FACILITY ENERGY COSTS
- 3205 PERSONAL SERVICE CONTRACTS
- 3206 GOODS & SERVICES
- 3207 CAPITALIZED GOODS AND NON CAP
- 3211 VENT FANS/MECH SYSTEMS PM
- 3212 TUNNEL FIRE PROTEC/HYDR SYS PM
- 3213 ELECTRICAL SYSTEMS PM
- 3231 VENT FANS/MECH SYS REPAIRS
- 3232 TUNNEL FIRE PROTEC/HYDR SYS RP
- 3233 ELECTRICAL SYSTEMS REPAIR
- 3234 AIR PLENUM PM & REPAIR
- 3235 CO MONITORS PM & REPAIR
- 3291 COMPUTER SYSTEM MAINT & REPAIR
- 3292 WASHING LUMINAIRES
- 3293 VENTILATION FAC MAINT/REPAIRS
- 3295 FLAGGING
- 3299 OTHER WORK NOT COVERED 3211 >

Group 5 - Snow & Ice Control

A - SNOW & ICE

5A1 Snow & Ice Control

2101PAYMENT TO CONTRACTOR
2102TRAVEL PER DIEM
2103EQUIPMENT RENTAL
2104FACILITY ENERGY COSTS
2105PERSONAL SERVICE CONTRACTS
2106GOODS & SERVICES
2107CAPITALIZED & NON-CAP OUTLAYS
2111SNOW BLOWER
2113MOLD BOARD PUSH PLOW
2115MOTOR GRADER WING PLOW
2117SNOW SLIDE/SNOW/DRIFT REMOVAL
2142MECH SWEEPING WINTER SAND REM
2143HAUL FOR MECH SWEEPING
2144FLUSHING - WINTER SAND REMOVAL
2151SAND/CHEM APPLICATION-MECH
2152CHEMICAL APPLICATION
2161INSTALL/REPR/REMV GUIDE STAKES
2162OPEN OUTLETS-RDWAY DRAINAGE
2163CALL BACK CREDIT
2164WINTER SAFETY PATROL
2165AVALANCHE CONTROL
2166STOCKPILE,RELOCATE/RESHP PILES
2167RADIO OP & ASSIGN TIME CHARGES
2168DORMITORY & DINING ROOM SVCS
2171SNOW / ICE STANDBY
2181FIELD SUPERVISION
2191CHG & INSTALL ATTACHMTS & MOVE
2193CLEANING EQUIPMENT
2195FLAGGING
2199OTHER WORK NOT COVERED 2111 >

Group 6 - Traffic Services

A - Traffic Control & Safety Maintenance

6A1 PAVEMENT STRIPING

2311 CENTERLINE
2312 EDGE LINE
2313 CENTERLINE/LANE BOUND,EDGES
2317 SWEEPING FOR STRIPING OPERATIONS
2318 GORE & SPECIAL MARKINGS
2351 RELIEF FOR 2311
2352 GUNNER/RELIEF DRIVER-FOR 2312
2353 GUNNER/RELIEF DRIVER-FOR 2313
2358 GUNNER/RELIEF DRIVER-FOR 2318
0900 PRORATED COSTS

6A2 RAISED PAVEMENT MARKERS

2315 REPL/INSTALL LANE MARKERS
0900 PRORATED COSTS

6A3 PAVEMENT MARKINGS

2321 CROSS WALKS
2322 STOP BARS
2325 MESSAGE ARROWS
2327 PAINT ISLANDS
2328 PAINT CURBS
2323 CROSS WALKS - THERMOPLASTIC
2324 STOP BARS - THERMOPLASTIC
2326 MESSAGES/ARROWS -THERMOPLASTIC
0900 PRORATED COSTS

6A4 REPAIR & REPLACE REGULATORY SIGNS

30% 2213 SIGN INSPECTION / PATROL
30% 2216 SIGN REPAIR
30% 2223 REPLACE OR INSTALL SIGN/POST
30% 2221 CLEAN OR WASH - MECHANICAL
30% 2222 CLEAN OR WASH - MANUAL
0900 PRORATED COSTS

6A5 REPAIR & REPLACE ADVISORY SIGNS

70% 2213 SIGN INSPECTION / PATROL
70% 2216 SIGN REPAIR
70% 2223 REPLACE OR INSTALL SIGN/POST
70% 2221 CLEAN OR WASH - MECHANICAL
70% 2222 CLEAN OR WASH - MANUAL
0900 PRORATED COSTS

6A6 REPAIR & REPLACE GUIDEPOSTS

2241 REPLACE GUIDEPOSTS/DELINEATORS
2242 REPAIR GUIDEPOSTS/DELINEATORS
0900 PRORATED COSTS

6A7 GUARDRAIL MAINTENANCE

2401 PAYMENTS TO CONTRACTOR
2402 TRAVEL PER DIEM
2403 EQUIPMENT RENTAL
2404 FACILITY ENERGY COSTS
2405 PERSONAL SERVICE CONTRACTS
2406 GOODS & SERVICES
2407 CAPITALIZED & NON-CAP OUTLAYS
2411 REPL/INSTALL/REPR STEEL GRDRAL
2413 CABLE RAIL
2491 CHG & INSTALL ATTACHMTS & MOVE
2495 TRAFFIC CONTROL ASSOC W 2211 >
2499 OTHER
0900 PRORATED COSTS

6A8 TRAFFIC SIGNAL MAINTENANCE

2511 SIGNAL DISPLAY/DETECT SYS PM
2531 SIGNAL DISPLAY/DETECT SYS REPR
2601 PAYMENTS TO CONTRACTOR
2602 TRAVEL PER DIEM
2603 EQUIPMENT RENTAL
2604 FACILITY ENERGY COSTS
2605 PERSONAL SERVICE CONTRACTS
2606 GOODS & SERVICES
2607 CAPITALIZED & NON-CAP OUTLAYS
2695 TRAFFIC CONTROL ASSOC W 2211 >
2611 SIGNAL CONTROL SYSTEM MAJOR PM
2612 SIGNAL CONTROL SYSTEM MINOR PM
2632 SIGNAL CONTROL SYSTEM REPAIR
2635 MISC ELECTRONIC EQ PM/REPAIR
2699 OTHER WORK NOT COVERED 2611 >>
0900 PRORATED COSTS

6A9 HIGHWAY LIGHTING MAINTENANCE

2701 PAYMENTS TO CONTRACTOR
2702 TRAVEL PER DIEM
2703 EQUIPMENT RENTAL
2704 FACILITY ENERGY COSTS
2705 PERSONAL SERVICE CONTRACTS
2706 GOODS & SERVICES
2707 CAPITALIZED & NON-CAP OUTLAYS
2750 TURN ON/OFF LIGHTS, PREV MAINT
2791 CHG & INSTALL ATTACHMTS & MOVE
2795 TRAFFIC CONTROL ASSOC W 2711 >
2711 ILLUMINATION SYSTEM PM
2715 ELECTRICAL SERVICE PM
2731 ILLUMINATION SYSTEM REPAIR
2737 ELECTRICAL SERVICES REPAIR
2799 OTHER
0900 PRORATED COSTS

6A10 SC&DI MAINTENANCE

2512 RAMP METER SYSTEM P.M.
 2513 CLOSED CIRCUIT TELEVISION P.M.
 2514 CHANGEABLE MESSAGE SIGN P.M.
 2515 HWY ADVISOR RADIO(H.A.R.) P.M.
 2516 EXP LANE GATES,SIGNS &BAR P.M.
 2532 RAMP METER SYSTEM REPAIR
 2533 CLOSED CIRCUIT TELEVISION REPAIR
 2534 CHANGEABLE MESSAGE SIGN REPAIR
 2535 HWY ADVISORY RADIO(H.A.R.)REPR
 2536 EXP LANE GATES,SIGNS&BARR REPR
 2537 MISC ELECTRICAL EQUIP PM &REPR
 0900 PRORATED COSTS

B - Permitting**6B1 PERMITS / FRANCHISES**

1401 PAYMENT TO CONTRACTOR
 1402 TRAVEL PER DIEM
 1403 EQUIPMENT RENTAL
 1404 FACILITY ENERGY COSTS
 1405 PERSONAL SERVICE CONTRACTS
 1406 GOODS & SERVICES
 1407 CAPITALIZED & NON-CAP OUTLAYS
 1431 VEHICLE PERMITS
 1432 FRANCHISE PERMITS
 1433 APPROACHES PERMITS

Costs to be Prorated to 6A4, 6A5, & 6A6

2201 PAYMENTS TO CONTRACTOR
 2202 TRAVEL PER DIEM
 2203 EQUIPMENT RENTAL
 2204 FACILITY ENERGY COSTS
 2205 PERSONAL SERVICE CONTRACTS
 2206 GOODS & SERVICES
 2207 CAPITALIZED & NON-CAP OUTLAYS
 2291 CHG & INSTALL ATTACHMTS & MOVE
 2294 DESIGN, LOC, CONTR. ENGR. PROJS
 2295 TRAFFIC CONTROL ASSOC W 2211 >
 2299 OTHER WORK NOT COVERED 2211 >

Costs to be Prorated to 6A1, 6A2, & 6A3

2301 PAYMENTS TO CONTRACTOR
 2302 TRAVEL PER DIEM
 2303 EQUIPMENT RENTAL
 2304 FACILITY ENERGY COSTS
 2305 PERSONAL SERVICE CONTRACTS
 2306 GOODS & SERVICES
 2307 CAPITALIZED & NON-CAP OUTLAYS
 2314 STANDBY DUE TO WEATHER/TRAFFIC
 2391 CHG & INSTALL ATTACHMTS & MOVE
 2392 EXCESSIVE CREW TRAVEL>40-1 WAY
 2394 DESIGN,LOC,CONTR. ENGR. PROJS.
 2395 TRAFFIC CONTROL ASSOC W 2211 >
 2399 OTHER WORK NOT COVERED 2311 >

Costs to be Prorated to 6A8 & 6A10

2501 PAYMENTS TO CONTRACTOR
 2502 TRAVEL PER DIEM
 2503 EQUIPMENT RENTAL
 2504 FACILITY ENERGY COSTS
 2505 PERSONAL SERVICE CONTRACTS
 2506 GOODS & SERVICES
 2507 CAPITALIZED & NON-CAP OUTLAYS
 2591 CHG & INSTALL ATTACHMTS & MOVE
 2595 CHG & INSTALL ATTACHMTS & MOVE
 2599 OTHER

Costs to be prorated to 6A1-6A10

2904 FACILITY ENERGY COSTS
 2906 GOODS & SERVICES
 2990 OTHER SERVICES

Group 7 - Rest Areas

A - REST AREAS

7A1 REST AREA MAINTENANCE

1701 PAYMENT TO CONTRACTOR
1702 TRAVEL PER DIEM
1703 EQUIPMENT RENTAL
1705 PERSONAL SERVICE CONTRACTS
1706 GOODS & SERVICES
1707 CAPITALIZED OUTLAY-EQUIPMENT
1711 POWER SPRAYING
1712 HAND WEEDING
1713 SOLID CHEMICAL WEED CTRL-HAND
1714 LIQUID CHEMICAL WEED CTRL-HND
1717 NOXIOUS WEED-POWER SPRAYING
1718 NOXIOUS WEED-CHEMICAL CONTROL
1719 NOXIOUS WEED-HAND
1725 CUTTING & DISPOSAL OF DEBRIS
1726 PRUNING/SELECT THINNING TREES
1736 BIOLOGICAL,CHEM,CULTURAL,MECH
1741 GRASS,TREES,SHRUBS,GRD COVER
1751 FERTILIZING,LIMING,REPLACE MUL
1752 HAND MOWING-EDGE TRIM,RAKE,ETC
1753 POWER MOWING-UP TO 72 INCH
1754 POWER MOWING-OVER 72 INCH
1761 OP OF SYSTEMS-MAINT REPR TEST
1773 LITTER PICK-UP
1781 GENERAL ROUTINE MAINTENANCE
1782 JANITORIAL SERVICE
1783 ELECTRICAL REPAIR & PREV MAINT
1788 MAINT & REPAIR-RV DUMP STATION
1789 TESTING OF WATER SYSTEM
1791 CHG & INSTALL ATTACHMTS & MOVE
1794 DESIGN,LOC, CONSTR ENGR -PROJECTS
1795 TRAFFIC CONTROL
1799 OTHER WORK NOT COVERED 1711 >

Group 8 - General Maintenance

A - Field Crew Supervision

8A1 FIELD SUPERVISION

6016 FIELD SUPERVISION-MAINT./LEAD
6027 ADMINISTRATIVE SUPERVISION
0900 PRORATED COSTS

COSTS PRORATED TO OTHER ACTIVITIES IN THIS GROUP

6001 PAYMENT TO CONTRACTOR
6002 TRAVEL PER DIEM
6003 EQUIPMENT RENTAL
6004 FACILITY ENERGY COSTS
6005 PERSONAL SERVICE CONTRACTS
6006 GOODS & SERVICES
6007 CAPITALIZED & NON-CAP OUTLAYS
6023 SHOP STEWARD ACTIVITIES

B - Employee Technical & Safety Training

8B1 TRAINING AND MEETINGS

6017 TRAINING/MEETINGS INCL TRAVEL
6032 INSTRUCTOR-EQ OP TRAINING
6033 DRUG AND ALCOHOL TESTING

C - Support Maintenance

8C1 SUPPORT MAINTENANCE

6014 MAINT OF STOCKPILE SITES
6015 YARD CLEAN UP
6019 SERVICING EQUIPMENT & TOOLS
6024 RADIO OPERATOR - EXC SNOW/ICE
6025 MANUAL WRITING & EDITING
6026 ASSISTANT STOREKEEPER
6028 TRAFFIC GEN FUNCTIONS STOREKEEPER
6031 TEF ASSIGNED HRS W 0 MONTH USE
6099 OTHER
6702 TRAVEL PER DIEM
6703 EQUIPMENT RENTAL
6706 GOODS & SERVICES
6711 DELAY DUE TO EQUIP BREAKDOWN
0900 PRORATED COSTS

Group 9 - 3rd Party Damages & Disaster Maintenance

A - 3rd Party Damages

9A1 3RD PARTY DAMAGES & REPAIR

3101 PAYMENT TO CONTRACTOR
3102 TRAVEL PER DIEM
3103 EQUIPMENT RENTAL
3104 FACILITY ENERGY COSTS
3131 TRAF SIGNS/DIR MARKRS/OTH DEVS
3105 PERSONAL SERVICE CONTRACTS
3106 GOODS & SERVICES
3111 ROADWAY SURFACE/SHLDRS/SIDES
3112 ROADSIDE REPAIR
3113 LANDSCAPE REPAIR/REPLACEMENT
3115 STRUCTURES
3120 HAZ WASTE/SPILL/DEBRIS CLEANUP
3131 TRAFFIC SIGNS/DIR MARKERS/OTHER DEVS
3151 GUARDRAIL
3152 ENERGY ABSORBING BARRIERS
3153 CONCRETE BARRIERS
3161 ELECTRICAL SIGNAL EQUIPMENT
3162 REPAIR/REPLACE GATES/BARRIERS
3171 HIGHWAY LIGHTING SYSTEM
3181 ROADSIDE REST AREAS
3182 PARK & RIDE LOTS
3185 CALL BACK CREDIT
3191 CHG & INSTALL ATTACHMTS & MOVE
3195 TRAFFIC CONTROL ASSOC W 3111 >
3199 OTHER WORK NOT COVERED 3111 >

B - Disaster Maintenance

9B1 ROADWAY DISASTER MAINTENANCE

4001 PAYMENT TO CONTRACTOR
4002 TRAVEL PER DIEM
4003 EQUIPMENT RENTAL
4004 FACILITY ENERGY COSTS
4006 GOODS & SERVICES
4008 SOME OLD WORKOP
4011 ROADWAY SURFACES
4013 DRAINAGE FACILITIES (DISASTER MAINT)
4015 LANDSCAPE, ROADSIDE, REST AREA
4019 STRUCTURES
4022 TRAFFIC SERVICES
4023 PREVIOUS BIENNIIUM WORKOP
4026 PREVIOUS BIENNIIUM WORKOP
4025 SUPERVISION
4095 TRAFFIC CONTROL
4099 OTHER

Maintenance Activities

Descriptions

M-1 MAINTENANCE MANAGEMENT AND SUPPORT

All activities related to administration and supervision of the maintenance program that cannot be directly connected to specific maintenance projects or activities at the field level, such as development of budgets, policy, program direction and union liaison. This includes the salaries, benefits and expenses of administrative staff in the Olympia Service Center and the Regions.

M-2 MAINTENANCE - ON STATE SYSTEM

All activities related to operation, maintenance and repair of the roadway and associated facilities in order to provide safe, reliable, and pleasant movement of people and goods.

General Notes:

1. The crew size and equipment identified for each activity is of what would be most commonly used in each situation. Others may be selected, when in the judgment of trained maintenance personnel, it is determined that other methods are necessary for safe, cost effective, and expeditious execution of the activity.
2. The crew size for many maintenance activities can vary from 1 to 6 people because additional traffic control may be needed to insure a safe work site. Many activities require one or more buffer trucks with a truck mounted attenuator and arrow boards. Highways that have high traffic volumes, are in urban locations, or have extensive curves with low visibility will require additional workers for traffic control purposes.

Group 1 - Roadway Maintenance & Operations

1A1 - Pavement Patching & Repair

Activities required to fix pavement deficiencies such as pot holes, alligator cracking, rutting, and others in order to extend the life of the pavement. Work may include digging out old broken pavement and any unstable base material, and placing and compacting new, free draining base material and asphalt mix with mechanized equipment or hand tools depending on the size of the patch. For large areas of deficient pavement, a overlay patch with hot-mix asphalt may be used. Crews doing this work may vary from 2 to more than 10 people, depending on the size of the repair and amount of equipment needed to accomplish the work. Equipment may include dump trucks, front end loader, motor grader, paving machine, steel roller, and oil distributor.

1A2 - Crack Sealing & Chip Seals

Activities required to repair cracks in asphalt and concrete pavement in order to extend the life of the pavement. Random cracking will appear in pavements due to natural aging and traffic action. Cracks over 1/4 inch wide should be filled to prevent water from entering into and weakening the underlying subgrade. Crack sealing is accomplished in one of two ways. Pouring hot liquid asphalt in the cracks, or using an asphalt distributor and spraying hot liquid asphalt or emulsified asphalt on the distressed pavement area, and covering it with crushed rock and rolling the rock to compact and seat the stones together. Crews doing this work may vary from 7 or more people, depending on the size of the repair and amount of equipment needed to accomplish the work. Equipment may include dump trucks, front end loader, motor grader, rubber tire roller, chip spreader, oil tank trailer and oil distributor.

1A3 - Shoulder Maintenance

Activities required to repair deficiencies in the gravel area adjacent to the edge of the pavement. Includes grading the gravel to repair erosion or where a drop-off has developed because of vehicles driving off the pavement edge. Also includes application of soil residual herbicides to prevent vegetation from growing in the gravel at the edge of the pavement. Crews doing this work may vary from 1 to 4 people, depending on the size of the repair and amount of equipment needed to accomplish the work. Equipment may include a motor grader for the grading work or a spray truck for herbicide application.

1A4 - Sweeping & Cleaning

Includes sweeping of paved shoulders and paved islands either by hand or with a self propelled mechanical sweeper. The work may include, removing built-up sand under guard rail, picking up all debris, hauling it to a nearby waste disposal site and washing the pavement with a street

flusher. Crews doing this work may vary from 1 to 6 people, depending on the amount of traffic control needed. Equipment may include a front end loader, motor grader with under guardrail cleaner board, dump trucks, sweeper and street flusher.

1A5 - Miscellaneous Roadway Maintenance

Includes grading and repairing gravel roads, and repairing broken curbs. This work will also include sand sealing asphalt pavement when excessive surface asphalt appears to improve traction. Crews doing this work may vary from 1 to 4 people, depending on the size of the repair and amount of equipment needed to accomplish the work. Equipment may include a motor grader, pavement burner, dump trucks, plus buffer trucks for traffic control.

1B1- Safety Patrol

Includes patrolling the highway to ensure that the roadway, shoulder, and right of way is free of objects that may be hazardous to the traveling public. Work includes traveling the roadway to inspect for hazardous conditions or problems. Situations requiring immediate attention such as rocks, debris, or dead animals on the roadway are corrected with out delay delay to minimize the traveling public's exposure to the hazard. Any conditions that require a crew or special equipment, such as damaged guardrail, a sign down, a rock slide or wind blown tree that has encroached on the roadway are reported to the area maintenance office for future scheduling of crew work plans. Safety patrols are routinely accomplished in areas that commonly have problems such a rock fall or slide areas , and high volume roadways where there is more likelihood of damage to occur or having debris on the roadway.

This activity also includes responding to complaints from the public or the State Patrol about hazards, phoned in to the area office. Each complaint must be responded to and the site of the identified problem inspected determine the severity of the proble and the appropriate remediation. Situations requiring immediate attention are corrected with out delay to minimize the traveling public's exposure to the hazard. The work is normally accomplished by one person in a truck.

Group 2 - Drainage Maintenance & Slope Repair

2A1- Grade & Clean Ditches

Includes all work necessary to remove soil and rock that have built up over time to restore the flow capacity of ditches. Work may include placing rock in ditches that have eroded to restore the original flow lines and control future erosion. Material that is removed from the ditch must be hauled to a suitable disposal site. Crews doing this work may vary from 1 to more than 7 people depending on the size of the repair and

amount of equipment needed to accomplish the work. Equipment may include dump trucks, front end loader, motor grader, belt loader, drot, or backhoe.

2A2 - Maintain Culverts

Includes all work necessary to keep cross culverts free of debris and siltation, including inspection to determine if cleaning is necessary. Also includes removing debris build-up, a beaver dam, or brush at culvert ends to insure they are free of obstructions. Crews doing this work may vary from 2 to 4 people depending on the size of the obstruction. Equipment may include a culvert rodder, dump truck, backhoe, and hand tools.

2A3 - Maintain Storm Drainage Systems

Includes all work necessary to restore flow and storage capacity of inlets, catch basins, manholes and connecting pipes including inspection to determine if cleaning is necessary. Work includes taking off the lid and removing built-up debris and silt. Crews doing this work may vary from 2 to 4 people depending on the amount of traffic control required. Equipment may include a vacuum truck, culvert rodder, water tank truck, dump truck, truck mounted attenuator, and hand tools.

2A4 - Maintain Silt Drainage Systems

Includes all work necessary to remove soil and silt build-up in retention and detention basins. Work also includes repair and cleaning of irrigation structures and fish ladders. Material that is removed from these basins must be hauled to a suitable disposal site. Crews doing this work may vary from 4 to more than 7 people, depending on the size of the repair and amount of equipment needed to accomplish the work. Equipment may include dump trucks, front end loader, excavator, or backhoe.

2A5 - Miscellaneous Drainage Maintenance

Includes cost for engineering and redesign of drainage features when modifications of drainage facilities is done by maintenance. Work is done by project development engineering staff and charged to maintenance.

2B1 - Slope Repair

Includes all work necessary to repair slope damage from slides, drifting sand or erosion. Work also includes repairing damage to riprap, cribbing, bulkheads, and dikes. For slide repair, the rock, mud, or dirt that has slid into the ditch or on the roadway must be removed and the ditch returned to it's original shape. Erosion repair will involve replacing the eroded material with rock, gravel or other material to stabilize the slope and restore it to it's original shape. It may also require removing

the eroded material if it has caused damaged to adjoining land. The crew size will vary greatly depending on the size of the slide or damage that has occurred and the amount of equipment needed to do the work. Equipment may include dump trucks, front end loader, excavator, or backhoe.

Group 3 - Roadside & Landscape Maintenance

3A1 - Litter Pickup

Includes all work necessary to remove litter, debris, and dead animal carcasses from the shoulder and roadside, and haul it to an appropriate disposal site. Also includes administration and operation of the Adopt-A-Highway Litter Control Program including providing safety hats and vests, signs and litter sacks to the groups and collecting the filled sacks and hauling to an appropriate disposal site. Work requires one or two people with a small truck, dump truck or garbage compactor.

3A2 - Noxious Weed Control

Includes all work necessary to eradicate and prevent the spread of seed from weeds identified in WAC 16-750 as a Class A or B noxious weed and growing on highway rights of way. The work may involve the spraying of herbicides, mowing, hand pulling, or application of biological control agents (bugs or diseases). Does not include preventive techniques such as seeding and fertilizing. Work is accomplished by one or two people using power spray equipment, or mowers.

3A3 - Nuisance Vegetation Control

Includes all work necessary to eradicate vegetation on the right of way that are not identified in WAC 16-750 as a Class A or B noxious weed, nor is it considered a safety hazard from highway operational standpoint. This type of vegetation is either aesthetically unsightly, or is a nuisance for adjacent property owners. Scotch Broom, blackberries, are two plants that typically fall into this category on the west side of the state. Morning Glory and Puncturevine are examples on the east side. Includes general mowing of roadside to improve neatness and appearance. The work may involve the spraying of herbicides, mowing, brushing with hand tools or power saws, pulling by hand, or application of biological control agents (bugs or diseases). Does not include preventive strategies such as seeding and fertilizing. Work is accomplished by one or 8 or more people depending on the amount and size of the vegetation removed. Equipment may include dump trucks, bucket truck, power spray equipment, mowers, spyder with a brush head.

3A4 - Control of Vegetation Obstructions

Includes all work necessary to eliminate vegetation on the right of way that is, or potentially will be, a safety hazard from a operational standpoint. This type of vegetation is either an obstruction to a vehicle leaving the highway that would cause damage if struck, or is an obstruction to the vision of motorists using the highway and would prevent someone from seeing an upcoming hazard and not allow adequate time to prevent an accident. The work also includes keeping sight lines to signs open, removal of trees and brush that shade the roadway and cause icing conditions during the winter, removal of vegetation that is a potential fire hazard and removal of trees that exhibit structural flaws which increase potential for failure and falling on the roadway. Also includes removal of trees that have fallen on the road after a snow or wind storm.

Major obstructions are danger trees, trees 4 inches in diameter or larger in the clear zone, and vegetation blocking regulatory and warning signs. Moderate obstructions include vegetation blocking sight lines to advisory signs, ditch lines, guardrail and guideposts. Vegetation that cause icing on the roadway or is a potential fire hazard also is considered a moderate hazard.

Potential obstructions are seedling trees that are not large enough to be a hazard but will be so in the future, or vegetation blocking sight lines to private approaches.

The work may involve the spraying of herbicides, mowing, brushing with hand tools or power saws, pulling by hand, or application of biological control agents (bugs or diseases). Does not include preventive strategies such as seeding and fertilizing. Work is accomplished by one to 8 or more people depending on the amount and size of the vegetation removed. Equipment may include dump trucks, bucket truck, power spray equipment, mowers, spider with a brush head, chipper, chain saw, pole saw, or hand tools.

3A5 - Miscellaneous Roadside Maintenance

Includes all activities related to the care of landscape plantings along pedestrian paths and trails, park and ride lots, view points and historical markers located on highway rights of way. Also includes planting erosion control grasses on any general roadside including fertilizing, and liming necessary for enhanced growth. Crew size will vary from 1 to 6 people depending on the size of the area involved. Equipment may include hand tools, belly grinder seed spreader, or air compressor and application gun.

3B1 - Landscape Maintenance

Includes all activities related to the care of ornamental landscape plantings along the highway and in interchanges. Work includes weed

prevention and eradication, operation and repair of irrigation systems, fertilizing, liming, pruning, trimming and mowing of lawns. Crew size may vary from 1 to 6 people depending on the size of the area being cared for. Equipment may include backhoe, truck, herbicide and insecticide spray equipment, chain saw, hand tools, and fertilizer spreader.

Group 4 - Bridge & Urban Tunnel Maintenance

4A1 - Bridge Deck Repair

Includes all work necessary to repair scaling, spalling, cracks, and exposed reinforcing steel on bridge decks. The work includes saw cutting and removal of broken asphalt or concrete from the damaged area and patching it with an appropriate mix or compound such as asphalt, epoxy or concrete. Work requires a crew of 6-8 people with an air compressor, jackhammer, concrete saw, front end loader, and trucks.

4A2 - Structural Bridge Repair

Includes all work necessary to repair deficiencies that affect the structural support systems of a bridge. This includes a wide variety of work including repairing piers or girders, replacing bearing pads, replacing damaged or deteriorated truss members, replacing or repairing expansion joints, repairing scour around piers, and removing debris build-up against piers, bulkheads, or pilings. Work requires a crew of 6-8 people with an air compressor, jackhammer, concrete saw, bucket truck, backhoe, and dump trucks.

4A3 - Bridge Cleaning

Includes all work necessary to clean bridge surfaces, sidewalks, and drains to prevent buildup of sand and debris, provide proper drainage, and an aesthetically clean appearance. Work includes sweeping and washing decks and sidewalks, power washing or sand blasting rust, moss, bird guano or dirt from surfaces, and cleaning plugged drains and grates so they flow freely. Work may require a crew of 6-8 people with an air compressor, power washer, sweeper, vactor truck, flusher truck, bucket truck, front end loader, and dump trucks.

4A4 - Miscellaneous Bridge Maintenance

Includes work to maintain floating bridges not covered by the activities listed above including pumping water out of pontoons and adjusting anchor cable tension. This work is necessary to keep the bridges afloat and in proper alignment. This activity also includes painting steel structures to prevent rusting and present an aesthetically pleasant appearance. Work may require a crew of 2 -6 people with an air compressor, truck, bucket truck, and crew truck.

4B1 - Operation Of Movable Bridges

Coast Guard regulations require that certain waterways be open to navigation at all times. Highway bridges that cross these waterways must either be high enough to allow ships and boats to pass underneath, or have the ability to move the span so ships and boats can pass on demand. This activity includes all work necessary to maintain and operate moving bridges that are not covered in the activities listed above. Work includes maintenance of all mechanical and electrical working parts so the bridges can be opened and closed when needed. The activity also included the work of opening and closing the bridge span. Work may require a crew of 1 or more people, and some must have special electrical and mechanical skills and licenses. Tools may include a variety of specialized electrical and mechanical equipment.

4B2 - Keller Ferry

Includes all work necessary to maintain and operate the Keller Ferry which crosses Franklin D. Roosevelt Lake (slackwater from Grand Coulee Dam) and is a vital transportation link for agricultural commerce on SR 21 between the communities of Republic and Wilbur. The ferry (the "Martha S.") is a diesel powered barge type boat that navigates the 1 1/2 miles, 18 hours a day, 365 days a year. The ferry is typically operated by a two person crew that must be licensed by the U.S. Coast Guard

4C1 - Urban Tunnel Maintenance

Urban tunnels in the Seattle area contain a number of safety and operational systems that are deployed during high traffic periods to ventilate the tunnels, or apply fire suppressants in the event of a fire. These systems require periodic testing, maintenance and operation. This activity includes all work necessary to insure all the mechanical, electrical, and electronic equipment such as exhaust fans, fire protection systems, carbon dioxide monitoring equipment, lighting, radio systems, and all other equipment including the computer control system is functional at all times. This activity does not include structural maintenance. This work requires a crew of 14 to 17 technically trained personnel with specialized skills including electricians, plumbers/pipefitters, millwrights, and electronics technicians.

Group 5 - Snow & Ice Control

5A1 - Snow & Ice Control

During winter months from November through March, the primary focus of highway maintenance is the removal of snow and ice from the highways across the state, and routine patrolling of the roadway for early detection of slides, icing, and other winter hazards.. This includes 10

mountain passes that remain open year round. On Snoqualmie and Stevens Passes, avalanche crews monitor, and control potential avalanches before they are a hazard to the traveling public. Due to the intensity of some storms, snow and ice can build-up on the roadway surfaces and traction sand is applied to provide a safer driving condition. In some critical locations “anti-icing” chemicals may be applied to prevent icing before it occurs. Between snow storms crews, in some areas, may sweep up accumulated sand, to reduce dust and minimize resulting air quality impacts. Highways are prioritized for snow and ice control based primarily on traffic volumes and functional class. Interstate and principal arterial highways with the highest average daily traffic within a given maintenance area, will normally receive the first attention. Since winter storms may occur at any time, during any day, staffing schedules are adjusted to provide a broader coverage and offer better response to storm events. Crew sizes will vary depending on the number of lane miles they are responsible for. Typical equipment may include dump trucks with a sander and a plow, motor grader, deicer tanker/truck, pickup truck, front end loader, or snow blower.

Group 6 - Traffic Services

6A1 - Pavement Striping

All highways have lines that delineate the travel lane for motorists. On multi-lane and two lane roadways this normally consists of a continuous edge strip closest to the outside shoulder on each side, and a dashed centerline down the middle, to separate the roadway from oncoming traffic. On hilly and curved roads additional yellow stripes will define “No Passing” Zones. The combination of traffic, sand, dirt & debris can wear these stripes away over time and they must routinely be replaced. Depending on the material used the stripes can be worn away over a winter season or within one calendar year. Most stripes are painted on the roadway, but there are some thermoplastic and methy methacrylate materials that can also be used for this purpose. Pavement striping normally requires a crew of six people. Equipment may include a paint truck, flat bed truck, van, and 2 or more trucks with a mounted attenuator.

6A2 - Raised Pavement Markers (Buttons)

On many highways the lines that delineate the traffic lanes and other pavement markings are made up of individual raised pavement markers (RPM's) or buttons. RPM's are also used to supplement painted lines. RPM's have the advantage of warning a motorist by sound when they are passing over them. This is important when the pavement is wet and painted lines are difficult to see. Traffic dislodge the RPM's over time and they must routinely be replaced. The RPM's are normally glued in place with a epoxy cement. Placing RPM's normally requires a crew of 5 people. Equipment may include a pickup truck, air compressor, and 2 or more trucks with a mounted attenuator.

6A3 - Pavement Marking

There are a variety of markings on the highway to advise and direct motorists. Crosswalks, stop bars, directional arrows, HOV diamond, and railroad crossings are just a few. The combination of traffic, sand, dirt & debris can wear these markings away over time and they must routinely be replaced. Most stripes are painted on the roadway, but thermoplastic can also be used for this purpose. Pavement marking replacement normally requires a crew of six people. Equipment may include a paint truck, flat bed truck, van, and changeable message sign mounted on a truck or trailer.

6A4 & 5 - Repair/Replace Regulatory & Advisory Signs

There are a variety of signs placed on the highway to regulate, advise, and inform motorists. Regulatory signs advise motorists of traffic regulations such as stop signs, speed limits signs, or yield. Advisory signs can tell the motorist how far it is to the next town, or warn of an upcoming condition such as "Watch For Ice", "Curve Ahead 35 MPH". Advisory signs can tell motorist of services that are available at the next interchange or what Adopt A Highway group is responsible for a given section of highway. These signs periodically get knocked down, are damaged in some manner, or eventually just lose their reflective properties and readability due to fading from exposure to the elements, or just get dirty. Sign cleaning, repair, or replacement normally requires a crew of two people. Equipment may include a flat bed truck, bucket truck, or a boom truck with a post hole digger.

6A6 - Repair/Replace Guideposts

Guide posts and delineators are placed along the edge of the highway to advise and guide motorists at intersections and on curves. These markers are a reflective indicator on a post used to aid night time driving or during inclement weather such as snow, rain, or fog. These guideposts periodically get knocked down, are damaged in some manner, or eventually just lose their reflective properties due to fading from exposure to the elements, or just get dirty. Cleaning, repair, or replacement normally requires a crew of four people. Equipment may include a flat bed truck, pickup truck with hand driver tools, bucket truck, air compressor, or a boom truck.

6A7 - Guardrail Maintenance

Guardrail is placed at the edge of the pavement to prevent vehicles from striking hazardous obstacles, oncoming traffic, or going down steep slopes. The purpose of the guardrail is to redirect errant vehicles and keep them on the road. Guardrail that is damaged must be repaired in order for it to maintain its functionality. Guardrail repair or replacement

normally requires a crew of 3 to 10 people using a flat bed truck, backhoe, post hole digger, and a dump truck.

6A8 - Traffic Signal Maintenance

Traffic signals control the flow and direction of traffic at major intersections. This highly technical equipment must function at all times to insure safe movement of vehicles through the intersection. Periodically bulbs burn out, or poles are damaged or are knocked down, control units malfunction and electrical wiring or services short out or are lost due to power failure. Repair or replacement of signal fixtures requires technically skilled electricians a truck, boom truck, bucket truck, and other specialized equipment.

6A9 - Highway Lighting Maintenance

Highway luminaires provide light at major intersections, interchange ramps, and along high volume highways to improve visibility and safety at night. Major signs are also lighted to improve visibility and readability. Periodically bulbs burn out, or light poles are damaged or are knocked down, or electrical wiring or services short out. Repair or replacement of lighting fixtures requires technically skilled electricians a truck, boom truck, bucket truck, and other specialized equipment.

6A10 -Surveillance Control & Driver Information (SC&DI) Device Maintenance

SC&DI equipment covers a broad variety of highly specialized equipment on the highway that is used to control and regulate the flow of traffic, and inform motorists. Examples of traffic control include ramp meters, reversible lane gates and signs, and variable speed limits signs. Informational equipment includes video cameras, highway advisory radio, and variable message signs. In some cases this equipment is part of a network that is operated through a central command center using telecommunications for operating and controlling the equipment. All such highly technical equipment requires routine maintenance in order for it to remain functional. Skilled electronics technicians use a variety of specialized equipment to maintain and operate the system. Crews range in size from 2 to 4 people depending of the complexity of the work.

Group 7 - Rest Area Maintenance

There are 38 major rest areas on the state highway system, 28 on interstate highways. The rest areas are small park-like sites that offer a place for motorists to stop, use a rest room facility, rest, relax, obtain limited refreshments and generally refresh themselves before continuing on their journey. All rest areas have rest rooms that must be cleaned and sanitized and litter receptacles emptied on a daily basis, and sites with picnic tables, landscaping, sidewalks and parking areas that must be

cared for. These site also have water and sewer systems that must meet public health regulations for operation. Rest areas are usually maintained by one or more attendants to clean and sanitize the building and empty litter. Site work is usually done by separate crews on an as needed basis.

Group 8 - General Maintenance

8A - Field Supervision

Supervision of crews at the field level on a day to day basis is done by a lead maintenance technician or maintenance supervisor. These supervisory people may be responsible for one or more crews depending on the complexity of the tasks the crew must accomplish. Supervisors are also responsible for answering calls and complaints from the public and making sure they are addressed satisfactorily. They also are responsible for coordinating with outside the agencies for a variety of reasons to accomplish future work or allow use of highway right of way. These request must be individually reviewed in the field to determine if they affect safety or jeopardize the highway facility in any way. The people at this level must also address a variety personnel issues from crew members such as call-outs for overtime, approving leave, and doing employee evaluations.

8A2 - Employee Technical & Safety Training

Training of employees is critical to having a proficient and skilled work force. Much of the equipment that maintenance uses is very technical and requires periodic training to stay current. Many jobs require special licenses that can only be renewed through a continuing education program and obtaining a minimum number of training credits each year. Some testing is mandated by federal law such as drug and alcohol testing, because of the safety aspect of the work.

8A3 - Support Maintenance

This activity covers a variety of miscellaneous things that are necessary in order for a maintenance organization to function efficiently and effectively. Such as servicing equipment and tools, organizing and inventorying stockpile sites and store rooms, and having a radio dispatcher.

Group 9 - 3rd Party Damages & Disaster Maintenance

9A1 - 3rd Party Damages

When ever an errant vehicle damages part of the highway facility such as the guardrail or a light pole, the driver is financially responsible for the

repair or replacement. When a maintenance crew repairs such damage they charge their work to this activity so the cost of the repair can be accounted for and recovered.

9A2 - Disaster Maintenance

Whenever a natural disaster such as earthquakes or floods damage the highway and is proclaimed a disaster by state or federal authorities, the cost for the repair of those damages may be recoverable through disaster relief funding. This may also include the cost of personnel setting up temporary traffic control, detours, or road closures, and any other work related to operating the roadway during these disasters. When maintenance people are involved in any disaster related work they charge their work to this activity so the cost can be accounted for and recovered.

TAB 3

What Are Maintenance Priorities?

Maintenance Activities

Priority Matrix

Contribution To Policy Objectives

- Critical Impact
- ◐ Significant Impact
- Contributing impact
- No impact

Category		Policy Objectives							Total Priority
Program Activities		Improve Safety	Operate Systems Reliably	Protect Our Investments	Support The Economy	Other Special Considerations	Meet Environmental Responsibilities	Contribute to Community & Aesthetics	
Num.		10	9	7	6	5	4	2	
1A1	Pavement Patching & Repair	●	●	●	●	●	◐	○	314
5A1	Snow & Ice Control	●	●		●	●		◐	276
4B1	Operation of Movable Bridges	●	●		●	●			270
9B1	Disaster Maintenance	●	●	●	◐	◐	○		270
2B1	Slope Repairs	●	●	●	○	◐	◐	○	266
6A8	Traffic Signal System Maintenance	●	●	○	○	●		◐	249
4B2	Operation of Keller Ferry	●	●		●	●			240
4C1	Urban Tunnel Maintenance	●	●	○	◐	◐	◐		226
2A2	Maintain Culverts	◐	●	●	○	○	◐	○	214
3A2	Noxious Weed Control	○	○	●	●	●	●	◐	214
6A10	SC & DI System Maintenance	●	●	○	○	◐		○	201
1B1	Safety Patrol	●	●	○		◐	○	○	198
4A2	Structural Bridge Repair	◐	◐	●	◐	●		◐	189
6A1	Pavement Striping	●	◐			●		●	180
6A2	Raised Pavement Markers	●	◐			●		●	180
6A4	Repair/Replace Regulatory Signs	●	◐	○	○	●	○	○	180
7A1	Rest Area Maintenance	◐	●	◐	◐	○	○	●	176
1A2	Crack Sealing & Chip Seals	○	●	●	○	○	○	○	170
2A3	Maintain Storm Drainage Systems	◐	◐	●	○	◐	◐	○	170
6A3	Pavement Marking	●	◐			●		◐	168
6A7	Guardrail Maintenance	●	◐	◐	○	◐	○	◐	168
4A1	Bridge Deck Repair	◐	◐	●	○	○		●	161
2A1	Grade and Clean Ditches	◐	◐	●	○	○	◐	◐	146
6B1	Issuing Oversized-overweight Permits	◐	◐	◐	○	●	◐	○	140
3A4	Control Of Vegetation Obstructions	◐	●	◐	◐	◐	◐	●	138
1A4	Sweeping and Cleaning	◐	◐	○		◐	●	◐	112
1A3	Shoulder Maintenance	◐	◐	◐	○	○	○	●	110
6A5	Repair/Replace Advisory Signs	◐	◐	○	○	◐	○	◐	94
6A9	Highway Lighting Maintenance	◐	◐	○	○	○		●	93
3A3	Nuisance Vegetation Control	○	○	◐	◐	◐	◐	◐	88
3B1	Landscape Maintenance	○	○	◐	◐	○	○	●	84
2A4	Maintain Silt Drainage Systems	○	○	○	○	◐	◐	○	76
6A6	Repair/Replace Guideposts	◐	○		○	◐		◐	66
3A1	Litter Pickup	○	○		○	○	○	●	57
1A5	Misc. Roadway Maintenance	○	○	○	○	○	○	○	42
2A5	Misc. Drainage Maintenance	○	○	○	○	○	○	○	42
3A5	Misc. Roadside Maintenance	○	○	○	○	○	○	○	42
4A4	Misc. Bridge Maintenance	○	○	○	○	○	○	○	42
4A3	Bridge Cleaning			◐			○	◐	30

Non-prioritized Support Activities									
8A1	Field Supervision								
8B1	Training and Meetings								
8C1	Support Maintenance								
9A1	3rd Party Damages & Repair								

Highway Categories

Category 1 Highway

Interstate with an ADT > 80,000

Category 2 Highway

Interstate or Principal Arterial with and ADT > 20,000

Category 3 Highway

Interstate or Principal Arterial with and ADT < 20,000

Minor Arterial with and ADT > 10,000

Category 4 Highway

Principal Arterial with ADT < 10,000

Minor Arterial with ADT < 10,000

Collector with ADT > 5,000

Category 5 Highway

Principal Arterial with ADT < 5,000

Minor Arterial with ADT < 5,000

Collector with ADT < 5,000

Special Criteria

A highway may be raised or lowered based on the following special criteria

1. Importance to commerce, truck routes, etc.
2. Important commuter routes
3. School bus routes
4. Proximity to population centers
5. Curvature & grade of highway alignment

Transportation Commission Policy Objectives

The Washington State Transportation Commission adopted the following policy during their May, 1996 meeting.

Purpose:

The purpose of Washington's transportation system is to provide safe, efficient, dependable and environmentally responsible transportation facilities and services to:

- Promote a positive quality of life for Washington citizens
- Enhance the economic vitality of all areas of the state
- Protect the natural environment and improve the built environment

Policy Objectives

- **Protect Our Investments** by keeping transportation infrastructure in sound operating condition.
- **Operate Transportation Systems** to work reliably and responsibly for the customer.
- **Improve Safety** through continuous reduction in the societal cost of accidents.
- **Provide Viable Mobility Choices** for the customer and expand the system to accommodate growth
- **Meet Environmental Responsibilities.**
- **Cooperate and Coordinate** with public and private transportation partners so that systems work together cost effectively.
- **Continuously Improve** the efficient and effective delivery of agency programs.

TAB 4

How Does Maintenance Measure Performance?

Maintenance Service Level Descriptions

Service Level A (Best)

This is a very high service level in which the roadway and associated features are in excellent condition.

At this maintenance service level, very few deficiencies are present and the overall appearance is pleasing. Preventive maintenance is a high priority in all maintenance activities resulting in overall low life-cycle costs. Corrective maintenance activities are minimal. All systems are operational and users experience no delays.

Service Level B

This is a high maintenance service level in which the roadway and associated features are in good condition.

At this maintenance service level, very few deficiencies are present in safety and investment protection activities, but moderate deficiencies exist in all other areas. Preventative maintenance is a high priority for safety-related work, is deferred in other areas, resulting in additional corrective maintenance activities. Corrective maintenance of all elements is given a high priority. Life-cycle costs for maintenance activities are generally low. All systems are operational. Users may experience occasional delays.

Service Level C

This is a medium maintenance service level in which the roadway and associated features are in fair condition.

At this maintenance service level, very few deficiencies are present in safety related activities, but moderate deficiencies exist for investment protection activities and significant aesthetic related deficiencies.. Preventative maintenance is deferred for many activities except safety-related work. Corrective maintenance is routinely practiced for all maintenance activities. A backlog of deficiencies begin to build up that will have to be dealt with eventually, at a higher cost. Some roadway structural problems begin to appear due to the long-term deterioration of the system. There is a noticeable decrease in appearance. Systems may occasionally be inoperable and not available to users. Short term delays may be experienced when repairs are being made, but would not be excessive (normally less than 1 day).

Service Level D

This is a low maintenance service level in which the roadway and associated features are kept in generally poor condition.

At this maintenance service level, moderate deficiencies are present in safety related activities, and significant deficiencies for all other activities. Very little

preventative maintenance is accomplished. Maintenance has become very reactionary and places emphasis on correcting problems as they occur. A significant backlog of deficiencies will begin to build up that have to be dealt with eventually, at a much higher cost. . Safety problems begin to appear that increase risk and liability, and significant roadway structural deficiencies exist that accelerate the long-term deterioration of the system. The overall appearance is very poor. Systems failures occur regularly because it is impossible react in a timely manner to all problems. Some delays may last longer than 1 day.

Service Level F (Worst)

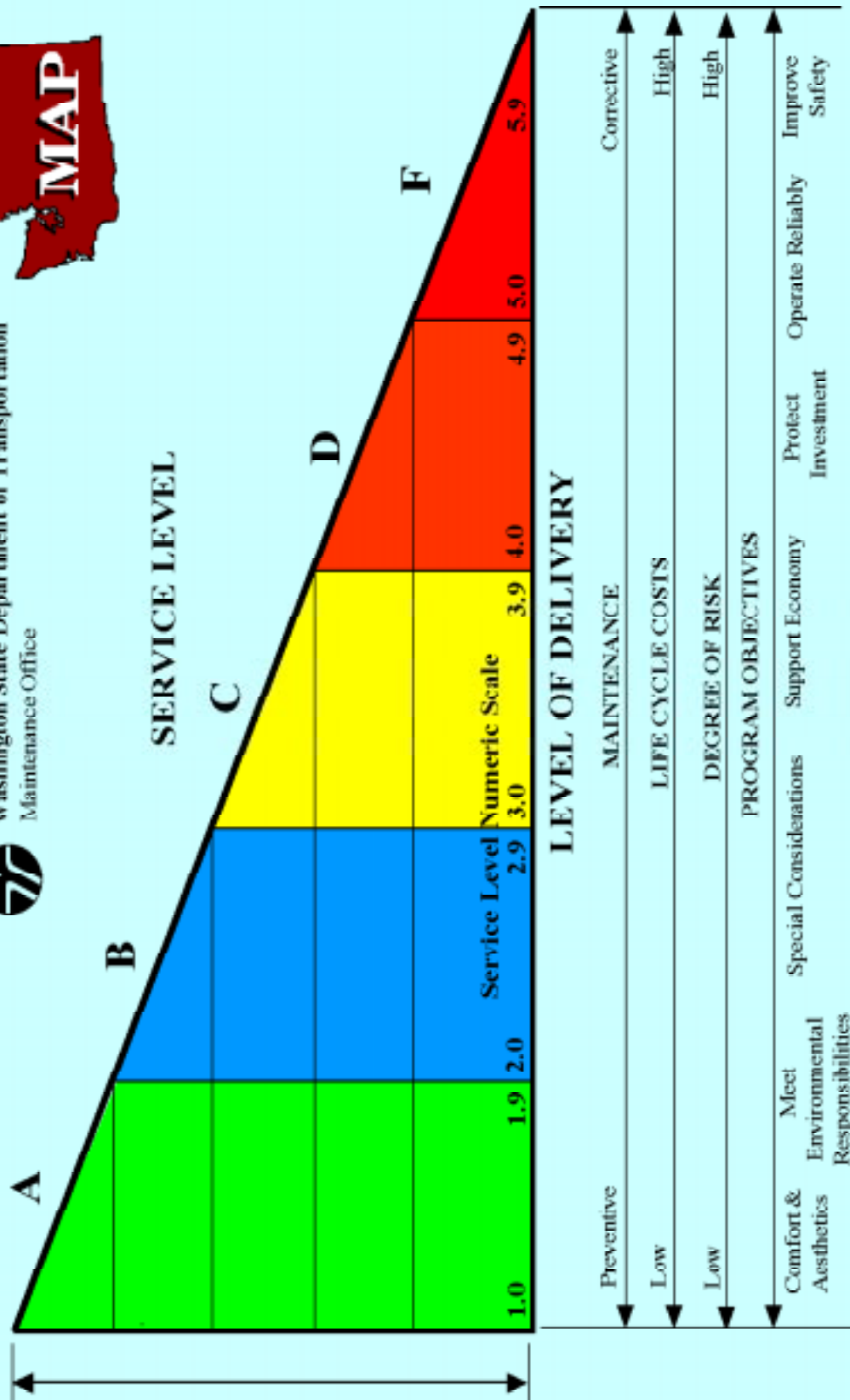
This is a very low service level in which the roadway and associated features are kept in poor and failing condition.

At this maintenance service level, significant deficiencies are present in all maintenance activities. The overall appearance is not aesthetically pleasing. Preventive maintenance is not practiced for any maintenance activities. Maintenance is a totally reactive operation, and places emphasis on correcting problems after they occur. Significant backlogs of maintenance deficiencies exist. Excessive safety problems occur, road conditions are such that maintenance treatments are not be enough to correct the deficiencies that exist, necessitating additional high-cost remedial construction preservation projects in the future. Overall maintenance operations are at their highest life-cycle costs. A backlog of systems failures would occur because it is impossible react in a timely manner to all problems. Delays may last longer than 1 day on a regular basis.

MAINTENANCE PROGRAM DELIVERY



Washington State Department of Transportation
Maintenance Office



Maintenance Performance Measures

Group 1-Roadway Maintenance & Operations

Category				Service Level					Condition Rating	
Roadway Maintenance				A	B	C	D	F		
Num.	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	Jan-96	Oct-96
1A1	Pavement Patching & Repair	Potholes (6"x6"x1" or larger)	Number of unfilled potholes per lane, per mile	0.50	2.00	4.00	6.00	>6.00	3.45	1.2
1A2	Crack Sealing & Chip Seals	Cracking	Linear ft. of pavement with unfilled cracks/joints per lane, per mile (incl. shoulders)	250	1,000	2,000	4,000	>4,000	969	655
1A3	Gravel/Sod Shoulder Maintenance	Shoulder edge drop-off or erosion >2" deep	% of shoulder with a drop-off or erosion greater than 2" deep	0%	5%	10%	20%	>20%	4.8%	3.8%
1A4	Sweeping and Cleaning	Sand, rocks and debris on paved shoulder	% of shoulder area with sand & debris	5%	10%	20%	40%	>40%	(13%)	6%
1A5	Misc. Roadway Maintenance	None	N/A							

(??) Condition estimated

Category				Service Level					Condition Rating	
Roadway Operations				A	B	C	D	F		
Num.	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	Jan-96	Oct-96
1B1	Safety Patrol	Rocks, large debris, and other hazards on roadway & shoulder	Objects on roadway & shoulder (See Condition Description Matrix -1B1)						Service Level C	Service Level C

Safety Patrol Service Level

Condition Description Matrix - 1B1

	Condition 1	Condition 2	Condition 3	Condition 4
Description	All major, moderate, & minor hazards are removed as soon as possible by routine patrols or immediate response to call-out problem conditions	All major & moderate hazards are removed as soon as possible by routine patrols, and immediate call outs. Low risk hazards are deferred until they can be fit in with other routine work	Major hazards are removed as soon possible with routine patrols & immediate call outs. Moderate and low risk hazards are deferred until they can be fit in with other routine work	Major hazards are responded to on a call-out basis only. All medium and low risk hazards are deferred until they can be fit in with other routine work.

Definitions:

Major hazard - First sized or larger object located in a traveled lane or paved shoulder. Motorists typically would reduce speed or try to avoid hitting a major hazard.

Moderate hazard - Smaller than first sized object located in a traveled lane or paved shoulder. Motorists may not reduce speed or try to avoid hitting a moderate hazard.

Minor hazard - Any debris or object(s) located within the traveled lane or paved shoulder that would not normally affect the speed vehicles traveling in the traveled lane.

Service Level Matrix

Level Of Service	A	B	C	D	F
Category 1 Highways	Condition 1	Condition 1	Condition 1	Condition 2	Condition 2
Category 2 Highways	Condition 1	Condition 1	Condition 2	Condition 2	Condition 2
Category 3 Highways	Condition 1	Condition 1	Condition 2	Condition 3	Condition 3
Category 4 Highways	Condition 2	Condition 2	Condition 3	Condition 3	Condition 4
Category 5 Highways	Condition 2	Condition 3	Condition 4	Condition 4	Condition 4

NOTES:

- Condition may vary temporarily because resources are required to accomplish other higher priority work.
- Category of highway is based on Functional Class and ADT. A highway may be raised or lowered, based on it's importance of the route to commerce, school bus routes, proximity to population centers, and curvature or grade of the alignment.

Maintenance Performance Measures

Group 2-Drainage Maintenance and Slope Repair

Category			Service Level					Condition Rating	
Drainage Maintenance			A	B	C	D	F	Jan-96	Oct-96
Num.	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	
2A1	Grade and Clean Ditches	Ditches with sediment buildup, unable to carry design flow	% of ditches >25% full	1%	5%	10%	15%	>15%	8.6%
2A2	Maintain Culverts	Culvert pipes plugged with dirt and/or debris, unable to carry design flow	% of pipes/culverts > 25% filled	1%	2%	5%	10%	>10%	13.4%
2A3	Maintain Storm Drainage Systems	Storm drain systems with blocked inlets, catch basins, and/or pipes	% of blocked storm drain inlets or silt build-up in pipes or catch basins > 25%	1%	5%	10%	15%	>15%	12.0%
2A4	Maintain Silt Basins	Silt basins unable to hold design capacity	% of silt basins > 25% filled	1%	5%	10%	15%	>15%	(8.1%)
2A5	Misc. Drainage Maintenance		N/A						

(??) Condition estimated

Category			Service Level					Condition Rating	
Slope Repair			A	B	C	D	F	Jan-96	Oct-96
Num.	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	
2B1	Slope Repairs	Unrepaired erosion or slides encroaching on, or undermining the shoulder or travel lane	Frequency of major and moderate slides or erosion encroaching, or undermining roadway per mile	<1 per 20 miles	1 per 10 miles	1 per 5 miles	1 per mile	> 1 per mile	(1 per 7 miles) 1 per 5 miles

Definitions:

Major erosion/slide - Erosion or slide that is jeopardizing the structural integrity or blocking the traveled lane(s).

Traffic must be detoured around the site or reduced to fewer lanes causing intermittent stoppages.

Moderate erosion/slide - Erosion or slide that is jeopardizing the integrity or blocking the ditch or shoulder.

Traffic may move slower through the area, but would normally not experience stoppages. No travel lanes are blocked.

Maintenance Performance Measures

Group 3-Roadside and Landscape Maintenance

Category				Service Level					Condition Rating	
Roadside Maintenance				A	B	C	D	F		
Num.	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	Jan-96	Oct-96
3A1	Litter Pickup	Presence of litter	# of > fist-sized objects present per centerline mile	< 125	250	500	1000	>1000	290	750
3A2	Noxious Weed Control	Presence of noxious weeds	% of roadside area w/ more than 1 Class A Weed or Class B Weed gone to seed	<2%	5%	10%	20%	>20%	(18%)	12.0%
3A3	Nuisance Vegetation Control	Presence of nuisance vegetation	% of roadside area w/nuisance weeds	<5%	10%	20%	30%	>30%	(15%)	20.0%
3A4	Control Of Vegetation Obstructions (Hazards)	Presence of major and moderate vegetation obstructions (hazards).	Linear feet of major and moderate hazards per centerline mile	0	10	20	40	>40	38	31.8
3A5	Misc. Roadside Maintenance		N/A							

Definitions:

1. Major Obstructions: Danger trees, trees 4" diameter or larger in clear zone, and vegetation blocking sight lines to regulatory and warning signs
2. Moderate Obstruction: Vegetation blocking sight lines to advisory signs, ditch lines, guardrail & guideposts. Areas of known fire potential or icing due to shading.

Category			Service Level					Condition Rating	
Landscape Maintenance			A	B	C	D	F		
Num.	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	
3B1	Landscape Maintenance	Appearance & health of landscaped areas	Condition Score (See Condition Description Matrix 3B1)	3	4	5 to 6	7 to 8	9	Jan-96 4 Oct-96 7

(??) Condition estimated

Landscape Maintenance Service Level

Condition Description Matrix - 3B1

	Weed Control	Plant Health	Trimming, Pruning, & Planting
Condition 1	<5% visible weeds	Plants healthy and lush <5% of the plants exhibit visible stress or disease Ground cover has 100% coverage Lawns contain <5% visible weeds and dry spots.	All plants exhibit appropriate shape and character Lawns mowed and trimmed regularly <5% voids in plant beds Plants have not overgrown their location
Condition 2	Planting beds with <15% visible weeds.	<15% of plants exhibiting some stress or disease Ground cover has no less than 90% coverage. <15% of lawn area contains visible weeds, dry spots.	No more than 15% of all plants exhibit sprouting or contain a few dead or dying branches Lawns mowed, but not trimmed regularly <15% voids in plant beds Plants have not overgrown their location
Condition 3	Planting beds with >15% visible weeds.	>15% of plants exhibiting some stress or disease Ground cover has less than 90% coverage. >15% of lawn area contains visible weeds, dry spots, and are allowed to go dormant in the summer.	More than 15% of all plants may exhibit sprouting or contain dead or dying branches Lawns mowed, until dormant, but not trimmed >15% voids in plant beds >15% of plants have overgrown their location.

Condition Total = Weed Control Condition + Plant Health Condition + Trimming, Pruning, & Planting Condition

Service Level _____ Condition Total

A	3
B	4
C	5 to 6
D	7 to 8
F	9

Maintenance Performance Measures

Group 4-Bridge & Tunnel Maintenance

Category			Service Level						Condition Rating		
Bridge Maintenance			A	B	C	D	F				
Item	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	Jan-06	Oct-06	
4A1	Bridge Deck Repair	Unrepaired deck spalling	% of unrepaired spalled areas, or size of spots at edge of deck (D spots)	1% or none	2% or <1"	5% or <3"	10% or <6"	>10% or <6"	8.7%	(8.7%)	
4A2	Structural Bridge Repair	Structural deficiencies (failures)	Accomplishment of identified structural deficiencies (See Condition Description Matrix - 4A2)	See Condition Description Matrix - 4A2						Service Level C	Service Level C-
4A3	Bridge Cleaning	Dirty/bridge surfaces and abutments. Blocked bridge drains. Grates	Condition Score (See Condition Description Matrix - 4A3)	4	7	10	13	>13	(9)	(9)	
4A4	Misc. Bridge Maintenance		N/A								
Category			Service Level						Condition Rating		
Bridge Operations			A	B	C	D	F				
Item	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	Jan-06	Oct-06	
4B1	Operation of Movable Bridges	Delayed opening/closing due to mechanical malfunction	Average frequency of mechanical malfunction per bridge	1 per yr.	1 per 6 mo.	1 per 3 mo.	1 per mo.	> 1 per mo.	1 per 3 mo.	1 per 3 mo.	
4B2	Operation of Water Ferry	Service availability	Hour/days of operation	24 hrs/day 365 days/yr	18 hrs/day 365 days/yr	14 hrs/day 365 days/yr	12 hrs/day 313 days/yr	8 hrs/day 261 days/yr	18 hrs/day 365 days/yr	18 hrs/day 365 days/yr	
Category			Service Level						Condition Rating		
Urban Tunnel Operations			A	B	C	D	F				
Item	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	Jan-06	Oct-06	
4C1	Operation of Urban Tunnel (Mechanical, Electrical, Hydraulic Systems)	Tunnel closure to flammable cargo due to malfunctioning mech. elec. hydraulic system	Number of tunnel closures to flammable cargo per year	5	10	25	50	>50	(20)	20	

Structural Bridge Repair Service Level

Condition Description Matrix - 4A2

	Priority 1 - Work	Priority 2 - Work
Description Of Typical Work	<p>Work includes critical structural repairs such as:</p> <ul style="list-style-type: none"> • Replacing rotten timber components • Repair spalled concrete on piers • Repair expansion joints • Address pier scour <p>Work should be accomplished as soon as possible, normally within one year.</p>	<p>Work includes non critical structural & non structural repairs such as:</p> <ul style="list-style-type: none"> • Correcting erosion problems around piers & abutments • Remove drift & repair fender systems • Repair compression seals in expansion joints • Repair damaged railings & curbs <p>Work should be scheduled as part of a biennial work program</p>

Service Level Matrix

Service Level	A	B	C	D	F
Work To Be Accomplished	All Priority-1 & Priority-2 work	15% of Priority-1 is deferred longer than 1 year. Priority-2 deferred as long as 3 years	30% Priority-1 deferred longer than 1 year Priority-2 deferred 3 years or more	50 % Priority-1 deferred longer than 1 year Priority-2 only done when P-1 is done on a bridge	>50% Priority-1 deferred more than 1 year Priority-2 may be deferred indefinitely

Bridge Cleaning Service Level

Condition Description Matrix - 4A3

	Decks & Sidewalks	Grates & Drains	Rails, Girders, Trusses, Piers & Abutments
Condition 1	Free of visible sand & debris	Grates & drains free of visible sand & debris	Free of moss, dirt, debris & bird guano
Condition 2	10% of surface area covered with sand or debris	Grates with some debris Drains open	Vertical surfaces have minor spots, stains, or debris build-up. Horizontal surfaces are free of dirt, moss, debris, or bird guano 1/8" of debris on top of pier caps.
Condition 3	20% of surface area covered with sand or debris	Grates <50% blocked Drains partially plugged	20% of vertical surfaces have minor spots, stains, or debris build-up. 5% of horizontal surfaces are free of dirt, moss, debris, or bird guano 1/4" of debris on top of pier caps.
Condition 4	40% of surface area covered with sand or debris	Grates covered <5% of drains plugged	50% of vertical surfaces have minor spots, stains, or debris build-up. 20% of horizontal surfaces are free of dirt, moss, debris, or bird guano 1/2" of debris on top of pier caps.
Condition 5	>40% of surface area covered with sand or debris	Grates & drains plugged. Water ponding on bridge deck	>50% of vertical surfaces have minor spots, stains, or debris build-up. >20% of horizontal surfaces are free of dirt, moss, debris, or bird guano >1/2" of debris on top of pier caps.

Condition Total = Decks & Sidewalk Condition + Grates & Drain Condition + Rails, Girders, Trusses, Piers & Abutments Condition

Service Level _____ Condition Total

- A 4 or less
- B 5 to 7
- C 8 to 10
- D 11 to 13
- F 14 or more

Maintenance Performance Measures

Group 5-Snow and Ice Control

Category				Service Level					Condition Rating	
Snow and Ice										
				A	B	C	D	F		
Num.	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	Jan-96	Oct-96
5A1	Snow & Ice Control	Timeliness of response to snow & ice on roadway, accumulation of snow on roadway, presence of traction aids (sand & deicers) when needed, pass opening and closing dates of seasonal roadways, presence of black ice.	Conformance to targeted condition goals (See Condition Description Matrix - 5A1)	See Condition Description Matrix - 5A1					Service Level C+	Service Level C+

Snow & Ice Control Service Level

Condition Description Matrix - 5A

	Condition 1	Condition 2	Condition 3	Condition 4
Description	Bare pavement condition maintained at all times. Traveler rarely experiences delays.	Traveler may experience some isolated delay with roads having patches of black ice, slush, or compact snow.	Traveler may experience delay and slow travel with roads having black ice or packed snow with only the wheel track bare.	Traveler will experience delays and slow travel with regular compact snow build-up and no bare pavement.

Level Of Service Matrix

Level Of Service	A	B	C	D	F
Category 1 Highways	Condition 1	Condition 1	Condition 1	Condition 1	Condition 2
Category 2 Highways	Condition 1	Condition 1	Condition 1	Condition 2	Condition 2
Category 3 Highways	Condition 1	Condition 1	Condition 2	Condition 3	Condition 3
Category 4 Highways	Condition 2	Condition 2	Condition 3	Condition 3	Condition 4
Category 5 Highways	Condition 2	Condition 3	Condition 4	Condition 4	Condition 4
Mountain Passes	Condition 1	Condition 1	Condition 2	Condition 2	Condition 3
Seasonal Highways *	Condition 2	Condition 2	Condition 3	Condition 4	Condition 4

* Seasonal highways have a planned closure during early winter. Level of service will determine the length of the closure.

LOS A has the shortest closure time, LOS F has the longest

NOTES:

1. Condition may vary temporarily depending on the frequency, duration and severity of snowfall events.
2. Category of highway is based on Functional Class and ADT. A highway may be raised or lowered based on it's importance of the route to commerce, school bus routes, proximity to population centers, and curvature or grade of the alignment.

Maintenance Performance Measures

Group 6-Traffic Services

Category			Service Level					Condition Rating	
Traffic Control and Safety/Maintenance			A	B	C	D	F	Jan-26	Oct-26
Item	Activity	Condition Indicator	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	Threshold
6A1	Pavement Striping	Worn or missing lane & edge stripes not visible at night	% of pavement striping not visible at night	1%	5%	10%	15%	≥15%	12.2%
6A2	Related Pavement Markers (Subtotal)	Missing markers (both/any)	% of pavement markers not visible at night	1%	5%	10%	15%	≥15%	14.0%
6A3	Pavement Marking	Stop bar, arrows, crosswalks, etc. having more than 25% worn or missing	% of pavement markings with more than 25% missing	2%	10%	20%	30%	≥30%	13.0%
6A4	Repair/Replace Regulatory Signs	Regulatory signs that are unreadable at night	% of regulatory signs unreadable at night	1%	2%	5%	10%	≥10%	8.2%
6A5	Repair/Replace Advisory Signs	Advisory signs that are unreadable at night	% of advisory signs unreadable at night	2%	5%	10%	15%	≥15%	16.0%
6A6	Repair/Replace Guideposts	Missing/damaged guideposts	% of guideposts defective	1%	5%	10%	20%	≥20%	10.0%
6A7	Guardrail Maintenance	Defective guardrail	% of guardrail defective	1%	2%	5%	10%	≥10%	2.7%
6A8	Traffic Signals	Traffic signals at an intersection flashing, with burnt out bulbs, or with a control system malfunctioning	Number of maintenance calls required for this type of malfunction	1 call-out in 3 years per signal	1 call-out in 2 years per signal	1 call-out per year, per signal	2 call-outs per year, per signal	3 or more call-outs per year, per signal	1 per 3.5 years 1 per 1.75 years
6A9	Highway Lighting Maintenance	Burned out highway lights	% of highway lights not working	5%	7.50%	10%	20%	≥20%	8.2%
6A10	SC & D System Safety Device Maintenance (Surveillance, Control, & Drive Information)	Malfunctioning loop sensors, reversible lane gates & sign malfunctioning	% of SC & D System components that are malfunctioning	0.50%	0.50%	1.00%	2.00%	≥2.00%	(1%) 0.8%

(*) Condition estimated

Category			Service Level					Condition Rating	
Permits			A	B	C	D	F	Jan-26	Oct-26
Item	Activity	Condition Indicator	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	Threshold
6B1	Issuing Over-size-overweight permits	Over-size-overweight permits issued correctly and in timely manner	% permits requiring greater than specified time for processing	2%	5%	10%	20%	≥20%	(3.5%) (3.5%)

Maintenance Performance Measures

Group 7-Rest Area Maintenance

Category			Service Level					Condition Rating		
Rest Area Maintenance			A	B	C	D	F			
Num.	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold		
7A1	Rest Area Maintenance	Cleanliness of building. Non-functional building/utility systems (hand dryer, soap dispenser, dump station). Appearance of landscaped areas, sidewalks & pavement	Condition Score (See Condition Description Matrix - 7A1)	4	7	10	13	>13	9	7.9

(??) Condition estimated

Rest Area Maintenance Service Level

Condition Description Matrix - 7A1

	Janitorial Services	Building & Utilities	Site	Operations
Condition 1	Rest rooms cleaned as necessary to meet highest standards for cleanliness. Graffiti is removed immediately. Counter tops and floors are cleaned a dried frequently. Soap & paper supplies routinely refilled during the day. Trash containers are emptied frequently.	Water & sewer systems functional and in compliance with regulations. Building in good repair, partitions, doors, dispensers in place without defects. Walls, roof, sky lights functional and free of defects. Dump station functional.	Landscape plantings healthy and lush & free of weeds. Lawns mowed and. Sidewalks & parking areas are clean and free of defects. Picnic tables clean and free of defects. Site free of noticeable litter.	All rest areas open 24 hours a day, 365 days a year.
Condition 2	Building cleaned routinely 2-3 times a day as required to meet a high standard for cleanliness. Graffiti is removed, counter tops and floors are cleaned a dried, soap & paper supplies are refilled, and trash containers are emptied during the daily routine cleaning.	Water & sewer systems functional. Building in good repair, with some surface defects but functional partitions, doors, dispensers in place. Dump station functional.	Landscape plantings healthy. Lawns mowed. Sidewalks & parking areas clean but exhibit some minor or defects. Picnic tables clean w/ minor or defects. No noticeable litter.	Most rest areas open 24 hours a day, 365 days a year. Selected non-interstate rest areas would be closed during low use periods, primarily during the winter months.
Condition 3	Building cleaned routinely 1-2 times a day as required to meet a minimum standard for cleanliness. Graffiti is removed, counter tops and floors are cleaned a dried, soap & paper supplies are refilled, and trash containers are emptied during the daily routine cleaning.	Water & sewer systems functional. Building with some surface and minor functional defects. Partition doors may be missing, some dispensers non-functional, lights out, mirrors missing. Dump station closed intermittently.	Landscape plantings exhibit some stress w/ some weeds and damaged or dying branches. Lawns infrequently mowed. Sidewalks & parking clean with noticeable defects. Picnic tables clean w/ minor or defects. Minor amount of noticeable litter.	All interstate rest areas open 24 hours a day, 365 days a year. All non-interstate rest areas would be closed during low use periods, primarily during the winter months.
Condition 4	Portable toilets & paper provided only. Routinely cleaned 1 time a day. Trash containers are emptied during routine cleaning.	Building closed because of a utility or building deficiency.	Landscape plantings with noticeable weeds, damaged or dying branches. Lawns unmowed. Sidewalks & parking noticeably dirty with major defects. Picnic tables need cleaning and exhibit major defects. Significant noticeable litter.	All rest areas closed.

Condition Rating = Janitorial Services Condition + Building & Utilities Condition + Site Condition + Operations

Service Level	Condition Total
A	4
B	5 to 7
C	8 to 10
D	11 to 13
F	14 & over

Maintenance Performance Measures

Group 8-Supervision, Training, and Support Maintenance

Category			Service Level					Condition Rating	
Field Crew Supervision			A	B	C	D	F	Jan-96	Oct-96
Num.	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	
8A1	Field Supervision	Field crew's activities properly planned and supervised	% of supervisor hours to total work hours						

Category			Service Level					Condition Rating	
Employee Technical / Safety Training & Meetings			A	B	C	D	F	Jan-96	Oct-96
Num.	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	
8B1	Training and Meetings	Employees with skills and knowledge required for quality, safe, efficient, customer service	% of training & meeting hours to total work hours						

Category			Service Level					Condition Rating	
Support Maintenance			A	B	C	D	F	Jan-96	Oct-96
Num.	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	
8C1	Support Maintenance	Maintenance radio system operated effectively, facilities operating costs reimbursed, equipment fleet non-use and downtime properly accounted	N/A						

Maintenance Performance Measures

Group 8-Supervision, Training, and Support Maintenance

Category			Service Level					Condition Rating	
Field Crew Supervision			A	B	C	D	F	Jan-96	Oct-96
Num.	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	
8A1	Field Supervision	Field crew's activities properly planned and supervised	% of supervisor hours to total work hours						

Category			Service Level					Condition Rating	
Employee Technical / Safety Training & Meetings			A	B	C	D	F	Jan-96	Oct-96
Num.	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	
8B1	Training and Meetings	Employees with skills and knowledge required for quality, safe, efficient, customer service	% of training & meeting hours to total work hours						

Category			Service Level					Condition Rating	
Support Maintenance			A	B	C	D	F	Jan-96	Oct-96
Num.	Activities	Condition Indicators	Performance Measures	Threshold	Threshold	Threshold	Threshold	Threshold	
8C1	Support Maintenance	Maintenance radio system operated effectively, facilities operating costs reimbursed, equipment fleet non-use and downtime properly accounted	N/A						

Maintenance Performance Measures

Group 9- 3rd-Party Damages and Disaster Maintenance

Category			Service Level					Condition Rating	
3rd Party Damages			A	B	C	D	F	Jan-96	Oct-96
Num.	Activities	Condition Indicators	Performance Measures						
9A1	3rd Party Damages & Repair	Damaged Features	See performance measure listed for the appropriate activity	Threshold	Threshold	Threshold	Threshold	Threshold	
			NA	NA	NA	NA	NA		

Category			Service Level					Condition Rating	
Disaster Maintenance			A	B	C	D	F	Jan-96	Oct-96
Num.	Activities	Condition Indicators	Performance Measures						
9B1	Disaster Maintenance	Area-wide flooding, earth slides, winds, or major earthquake causing transportation system damage above routine levels	N/A						

Notes:

1. 3rd Party damages estimated at 5 year average level. Repairs made as needed
2. Disaster funds not budgeted

TAB 5

What Are You Providing Now?

M2 Program Service Level

Statewide Average 1/96 - 10/96

Number	Activity	Service Level											
		1.0	1.9	2.0	2.9	3.0	3.9	4.0	4.9	5.0	5.9		
		+	A	-	+	B	-	+	C	-	+	D	-

Group 1 - Roadway Maintenance & Operations

1A1	Pavement Patching & Repair												
1A2	Crack Sealing & Chip Seals												
1A3	Shoulder Maintenance												
1A4	Sweeping and Cleaning												
1A5	Misc. Roadway Maintenance												
1B1	Safety Patrol												

Group 2 - Drainage Maintenance & Slope Repair

2A1	Grade and Clean Ditches												
2A2	Maintain Culverts												
2A3	Maintain Storm Drainage												
2A4	Maintain Silt Drainage												
2A5	Misc. Drainage Maintenance												
2B1	Slope Repairs												

Group 3 - Roadside & Landscape Maintenance

3A1	Litter Pickup												
3A2	Noxious Weed Control												
3A3	Nuisance Vegetation Control												
3A4	Control Of Vegetation												
3A5	Misc. Roadside Maintenance												
3B1	Landscape Maintenance												

Group 4 - Bridge & Tunnel Maintenance

4A1	Bridge Deck Repair												
4A2	Structural Bridge Repair												
4A3	Bridge Cleaning												
4A4	Misc. Bridge Maintenance												
4B1	Operation of Movable												
4B2	Operation of Keller Ferry												
4C1	Urban Tunnel Maintenance												

Group 5 - Snow & Ice Control

5A1	Snow & Ice Control												
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Group 6 - Traffic Services

6A1	Pavement Striping												
6A2	Raised Pavement Markers												
6A3	Pavement Marking												
6A4	Repair/Replace Regulatory												
6A5	Repair/Replace Advisory												
6A6	Repair/Replace Guideposts												
6A7	Guardrail Maintenance												
6A8	Traffic Signal System												
6A9	Highway Lighting												
6A10	SC & DI System Maintenance												
6B1	Issuing Oversized-overweight												

Group 7 - Rest Area Maintenance

7A1	Rest Area Maintenance												
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Maintenance Program (M2) Service Level

Region: _____ Area: _____		Service Level														
Number	Activity	+	A	-	+	B	-	+	C	-	+	D	-	+	F	-

Group 1 - Roadway Maintenance & Operations

1A1	Pavement Patching & Repair															
1A2	Crack Sealing & Chip Seals															
1A3	Shoulder Maintenance															
1A4	Sweeping and Cleaning															
1A5	Misc. Roadway Maintenance															
1B1	Safety Patrol															

Group 2 - Drainage Maintenance & Slope Repair

2A1	Grade and Clean Ditches															
2A2	Maintain Culverts															
2A3	Maintain Storm Drainage Systems															
2A4	Maintain Silt Drainage Systems															
2A5	Misc. Drainage Maintenance															
2B1	Slope Repairs															

Group 3 - Roadside & Landscape Maintenance

3A1	Litter Pickup															
3A2	Noxious Weed Control															
3A3	Nuisance Vegetation Control															
3A4	Control Of Vegetation Obstructions															
3A5	Misc. Roadside Maintenance															
3B1	Landscape Maintenance															

Group 4 - Bridge & Tunnel Maintenance

4A1	Bridge Deck Repair															
4A2	Structural Bridge Repair															
4A3	Bridge Cleaning															
4A4	Misc Bridge Maintenance															
4B1	Operation of Movable Bridges															
4B2	Operation of Keller Ferry															
4C1	Urban Tunnel Maintenance															

Group 5 - Snow & Ice Control

5A1	Snow & Ice Control															
-----	--------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Group 6 - Traffic Services

6A1	Pavement Striping															
6A2	Raised Pavement Markers															
6A3	Pavement Marking															
6A4	Repair/Replace Regulatory Signs															
6A5	Repair/Replace Advisory Signs															
6A6	Repair/Replace Guideposts															
6A7	Guardrail Maintenance															
6A8	Traffic Signal System Maintenance															
6A9	Highway Lighting Maintenance															
6A10	SC & DI System Maintenance															
6B1	Issuing Oversized-overweight															

Group 7 - Rest Area Maintenance

7A1	Rest Area Maintenance															
-----	-----------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TAB 6

What Will You Do With The Money?

SERVICE LEVEL INVESTMENT WORKSHEET

Roadway Maintenance and Operations

Group - 2
Drainage Maintenance & Slope Repair

65

SERVICE LEVEL MATRIX

SERVICE LEVEL INVESTMENT WORKSHEET

Group - 4
Bridge & Tunnel Maintenance

MAINTENANCE SERVICE LEVEL GROUP 5 - SNOW & ICE CONTROL

Condition - 1



Bare pavement condition maintained. Traveler rarely experiences delays.

Condition - 2



Snow build-up encountered occasionally. Traveler may experience some isolated delay with roads having patches of black ice, slush, or packed snow.

Condition - 3



Snow build-up encountered regularly. Traveler likely to experience some delay and slow travel with roads having black ice or packed snow with only wheel track bare.

Condition - 4



Compact snow build-up encountered regularly. Traveler will experience delays and slow travel.

SERVICE LEVEL MATRIX

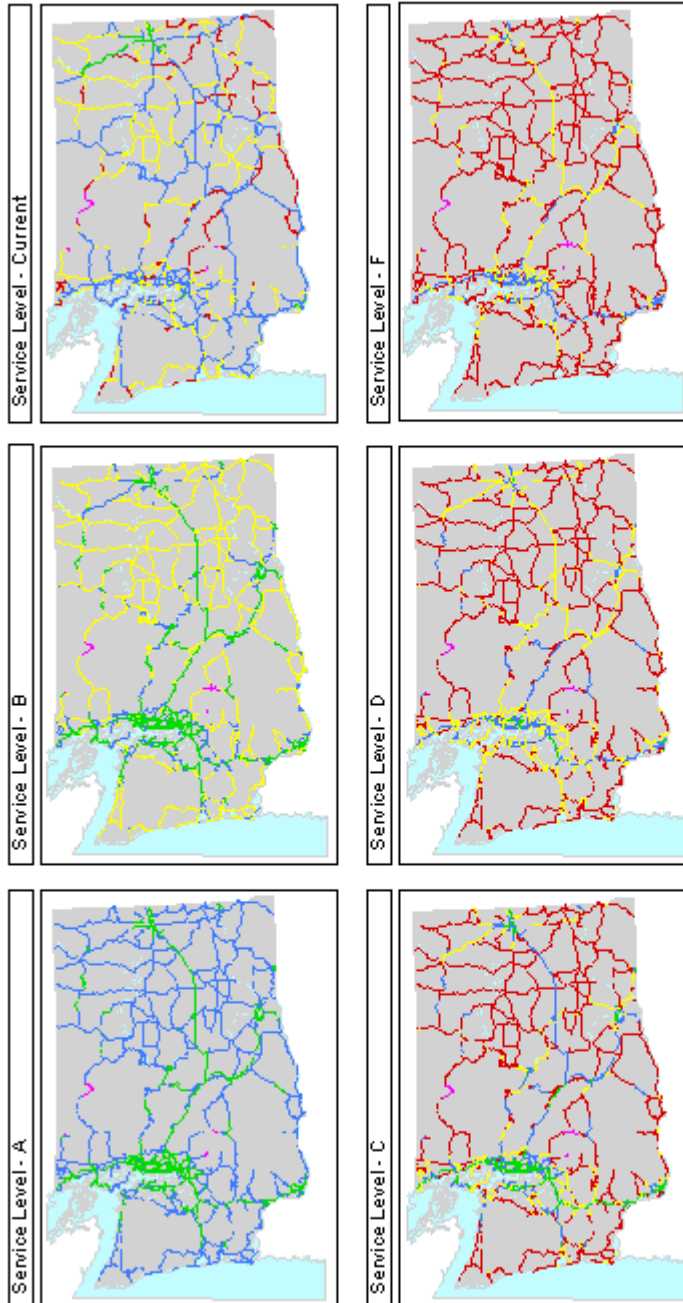
SERVICE LEVEL	A	B	C	D	F
Category 1 Highways	Condition 1	Condition 1	Condition 1	Condition 1	Condition 2
Category 2 Highways	Condition 1	Condition 1	Condition 1	Condition 2	Condition 2
Category 3 Highways	Condition 1	Condition 1	Condition 2	Condition 3	Condition 3
Category 4 Highways	Condition 2	Condition 2	Condition 3	Condition 3	Condition 4
Category 5 Highways	Condition 2	Condition 3	Condition 4	Condition 4	Condition 4
Mountain Passes	Condition 1	Condition 1	Condition 2	Condition 2	Condition 3
Seasonal Highways ^A	Closed	Closed	Closed	Closed	Closed

^A Seasonal highways have a planned closure during winter. Service level will determine the length of closure. Service Level - A has the shortest closure time, Service Level - F has the longest.

- NOTES:**
- Condition may vary temporarily depending on the frequency, duration, and severity of snowfall events.
 - Category of highway is based on Functional Class and ADT. A highway's category may be raised or lowered based on its importance to commerce, school bus routes, proximity to population centers, and curvature or grade of alignment.

**Group - 5
Snow & Ice Control**

MAINTENANCE SERVICE LEVEL
GROUP 5 - SNOW & ICE CONTROL



SERVICE LEVEL INVESTMENT WORK SHEET






		CURRENT LAW BUDGET				Service Level								
Number	Activity	CAL - Initiation	Decision Package		TOTAL CLD	+ A -	Investment Threshold	+ B -	Investment Threshold	+ C -	Investment Threshold	+ D -	Investment Threshold	+ E -
			System Addition	Service Delivery Increase										
22	State & Ice Control	541,000,000	1,000,000	1,000,000	542,000,000	542,000,000	25,000,000	567,000,000	567,000,000	567,000,000	567,000,000	567,000,000	567,000,000	567,000,000
Group 5 Total		541,000,000	1,000,000	1,000,000	542,000,000	542,000,000	25,000,000	567,000,000	567,000,000	567,000,000	567,000,000	567,000,000	567,000,000	567,000,000

Group - 5
Snow & Ice Control

SERVICE LEVEL INVESTMENT WORKSHEET

Group - 6
Traffic Services

MAINTENANCE SERVICE LEVEL GROUP 7 - REST AREA MAINTENANCE

Service Level - A	Service Level - B	Service Level - C	Service Level - D	Service Level - F
				
Restrooms cleaned as necessary to meet highest standards for cleanliness. Landscapes healthy and maintained with minimal maintenance. Grounds are clean with minimal litter.	Building cleaned on the 2-3 times a day to meet most standards for cleanliness. Landscapes healthy but with some places. Grounds clean but with minor amount of litter. Facility has minor amount of ground and litter.	Building cleaned roughly 1-2 times a day to meet moderate standards for cleanliness. Building has a moderate amount of ground and surface damage. Grounds have moderate amount of litter and damage to picnic tables. Landscapes are moderately stressed and worn in places.	Building cleaned roughly once a day to meet minimum standard for cleanliness. Building has a significant amount of ground and surface damage. Landscapes are significantly stressed and worn. Grounds have significant amount of litter and damage to picnic tables.	Portable toilet and paper provided only. Building closed due to roof or building debris loss. Landscapes worn and stressed. Grounds have significant litter and debris. Some restrooms closed.

SERVICE LEVEL INVESTMENT WORKSHEET

CURRENT LAW BUDGET		Service Level				
Number	Activity	Cal + Inflation	Decision Package System Addition	Service Package Cost Increase	TOTAL CLD	
72	Rest Area Maintenance	7,743,357	7,743,357	7,743,357	7,743,357	
Group 7 Total		7,743,357	7,743,357	7,743,357	7,743,357	

TAB 7

Are You Efficient?

Maintenance Program Efficiency Summary

The Maintenance Management and Administration Evaluation (prepared by the Dye Management Group, Inc., June 1996) reviewed how the Washington State Department of Transportation (WSDOT) manages its maintenance program and how efficiently it manages its maintenance resources. Specifically, the study compared WSDOT's maintenance operations, management structure and decision-making hierarchy, and workforce size, composition, and distribution with other state, county, and city DOT's.

In general, the consultant found that:

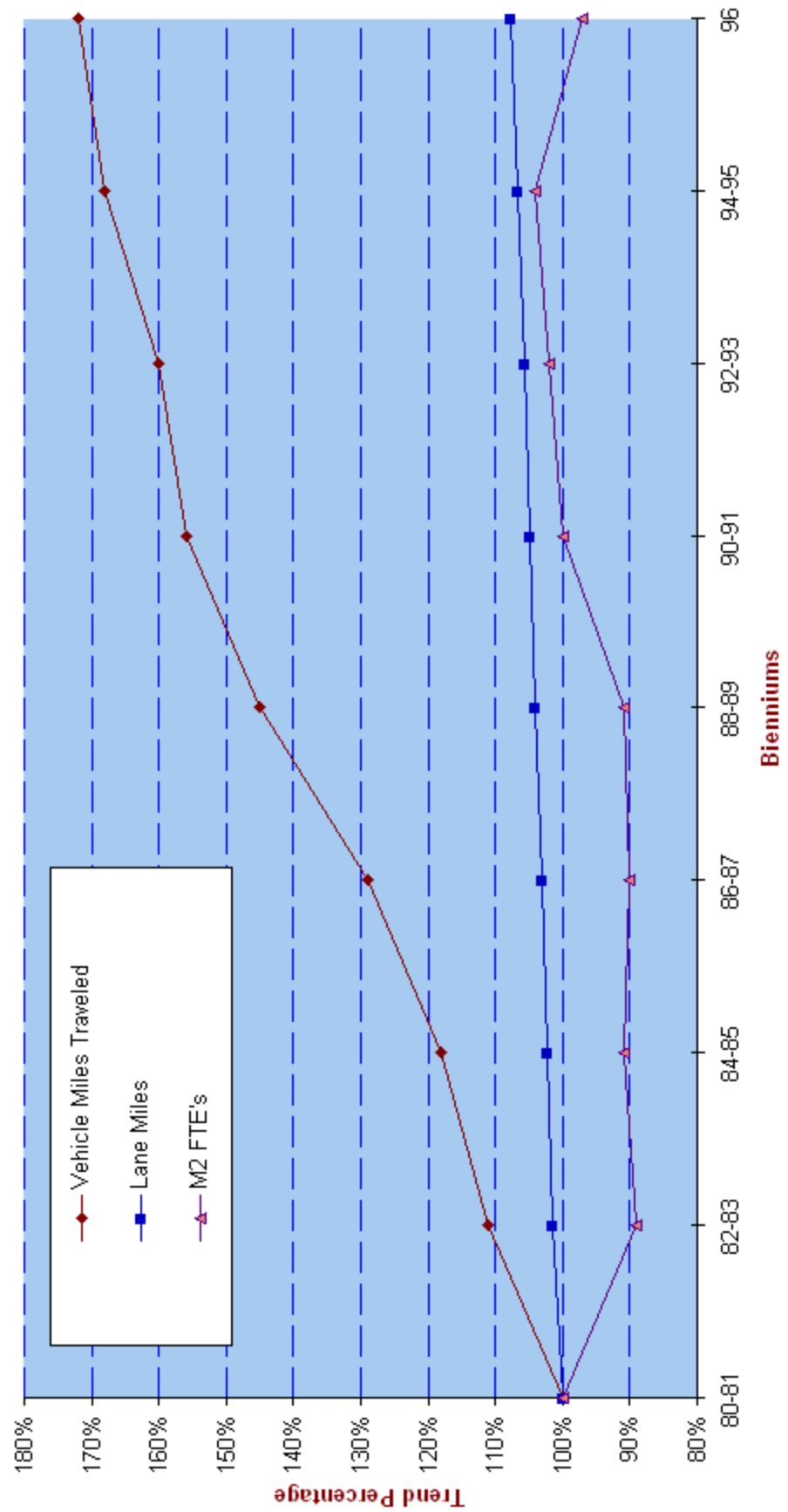
- WSDOT's maintenance operating practices and program management is comparable to standard industry practice.
- The number of maintenance program (M2) FTE's (1183) are reasonable for current appropriations and Service Level goals.
- WSDOT's maintenance equipment fleet size, composition, age, and use are acceptable.

However, the consultant did suggest that some maintenance program efficiencies could be gained if:

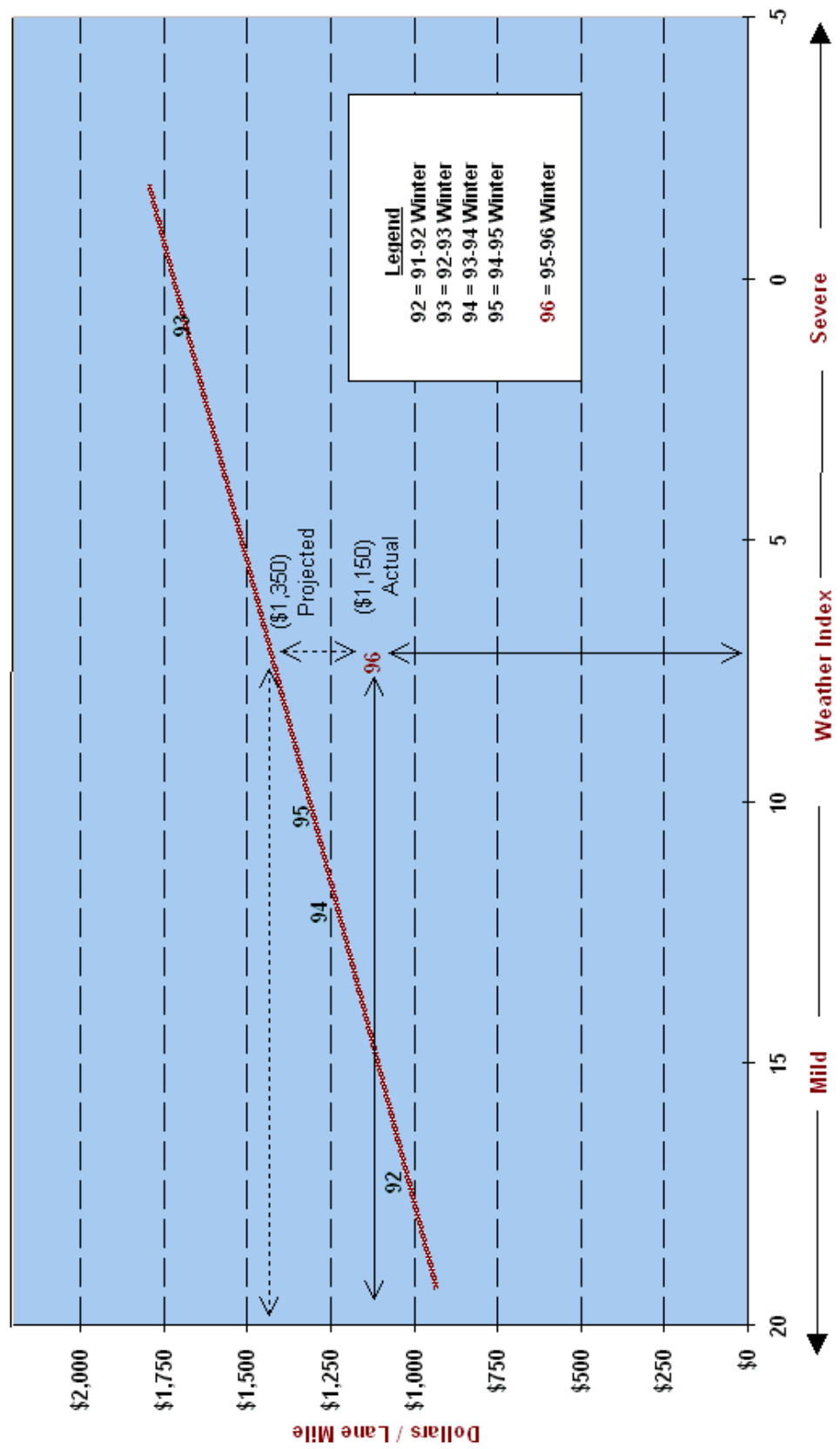
- Some private sector contracting of maintenance activities, now prohibited by statutory limitations, were allowed.
- The \$30,000 limit on WSDOT-performed work, which limits more cost effective in-house alternatives, were allowed.
- The Maintenance Accountability Process (MAP) were implemented, including:
 - Outcome-based performance measures
 - Updated Maintenance Management System

To date, WSDOT, in conjunction with the Legislative Transportation Committee (LTC) and LTC staff, have reviewed the consultants efficiency recommendations and have elected to focus implementation initially on refinement and utilization of the Maintenance Accountability Process (MAP), including outcome-based performance measures. Recommendations regarding changes to state statute (contracting out and state force work limitations) have been set aside for further Legislative policy discussions. Implementing an updated maintenance management system, due to high start-up and on-going costs, has been deferred pending further cost-benefit analyses.

Historical Trends 1980 - 1996



Snow & Ice Control Costs

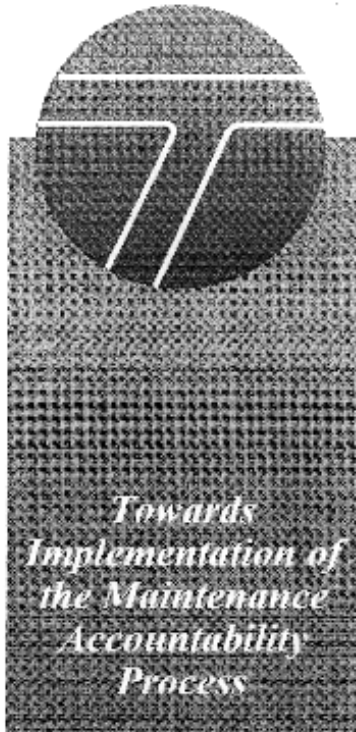


TAB 8

Appendix

DYE MANAGEMENT GROUP, INC.

Washington State
Department of
Transportation



Maintenance Management and Administration Evaluation

June 30, 1996

DYE MANAGEMENT GROUP, INC.

In conjunction with:

Roy Jorgensen Associates
Kato and Warren Consultants
Carolyn Browne Associates

MANAGEMENT • PLANNING • POLICY • TECHNOLOGY

CITY CENTER BELLEVUE, SUITE 1700 • 500 NORTH AVENUE N.E. • BELLEVUE, WA 98004-5590 • (206) 637-8010 FAX (206) 637-8020

Washington State Department of Transportation Maintenance Management and Administration Evaluation

EXECUTIVE SUMMARY



A. Purpose

This is the Maintenance Management and Administration Evaluation. This study was directed by the Washington State Legislature in 1995. It was born from the frustration of the Legislature in obtaining information about maintenance policies, procedures and expenditures and the difficulty for the Washington State Department of Transportation (WSDOT) in providing this information. The study was to:

- Assess current public opinion regarding maintenance.
- Develop outcome-based performance measures for maintenance and evaluate methods for providing a consistent level of service throughout the state.
- Establish a link between maintenance level of service standards and resources to facilitate performance based maintenance budgets.
- Evaluate the feasibility of developing a maintenance management system.
- Identify potential efficiencies, including benchmarking WSDOT maintenance practices against other jurisdictions.
- Evaluate options for centralized versus decentralized management of maintenance.
- Evaluate the accountability and oversight of the maintenance program and the Transportation Equipment Fund.
- Evaluate options to improve communications between the WSDOT and the Legislature.

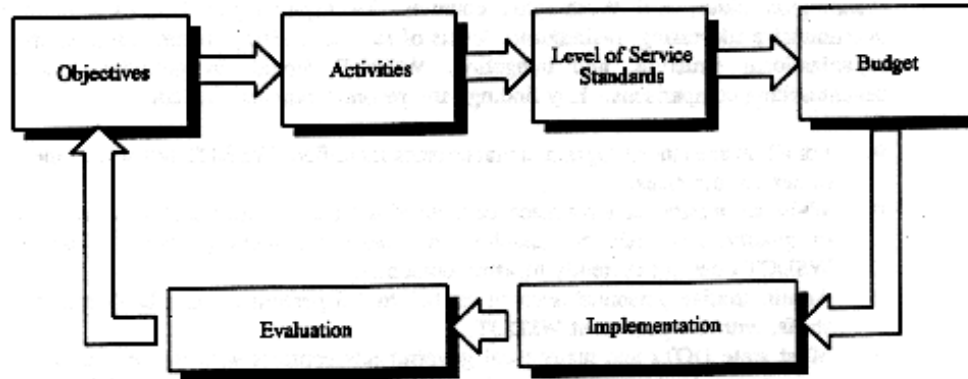
B. Maintenance Accountability Process

This study recommends a fundamentally new approach to WSDOT maintenance management, the Maintenance Accountability Process. This will establish a new basis for understanding between the citizens, the Legislature, the Governor, and the WSDOT concerning maintenance. The Maintenance Accountability Process will provide a clear, measurable link between maintenance objectives, activities, level of service standards, the budget, implementation and evaluation. It will be a means to ensure that the needs and priorities of the public are understood; the Transportation Commission, Governor, and Legislature can set policy and budget levels and understand their impacts; and, that the WSDOT has the management latitude and resources required to implement policy. There will be tough decisions in the future about maintenance and this new process will provide the framework for making those decisions. It will be a national model for maintenance policy-setting, budgeting, management and quality. Exhibit E-1 depicts the components of the Maintenance Accountability Process.

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DYE MANAGEMENT GROUP, INC.

Exhibit E-1 Maintenance Accountability Process



C. Public Perceptions

In order to assess public perceptions on maintenance levels of service, a statistically valid statewide telephone survey was conducted and two focus groups were held. Visual representations of maintenance conditions helped focus group participants to rank current and desired maintenance conditions on roadways under WSDOT's jurisdiction. This understanding of public perceptions can provide a basis to set maintenance policy. WSDOT should update this information over time.

The information indicates that Washington residents:

- Feel overall highway maintenance is relatively good.
- Believe Washington's highways are better maintained than those in other states, although fewer people hold this view today than in a comparable survey conducted in 1984.
- Desire increased levels of service in virtually all areas of highway maintenance.
- Would be willing to pay more to achieve their desired levels of maintenance service and to reduce future costs.
- Rank safety and reliability as the most important maintenance program objectives and roadway surface maintenance as the highest priority maintenance activity.
- Have fairly consistent opinions across the state: Eastern Washington, Western Washington - Rural, Western Washington - Urban.

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D. Benchmarking Results

WSDOT maintenance practices were compared with the maintenance efforts of other states, Washington cities, and Washington counties. Twenty-two jurisdictions completed a questionnaire addressing: maintenance levels of service, staffing, contracting, equipment, organizational structure, and budgeting. WSDOT should do periodic updates of benchmarking comparisons. Key findings and recommendations include:

- For all maintenance program characteristics identified, WSDOT fell within the range of current practices.
- While seven states have maintenance level of service standards that measure outcomes or quality, most rely on guidelines that leave considerable room for discretion. WSDOT does not currently measure outcomes.
- Administrative personnel account for 0.5 to 4.5 percent of state DOT maintenance staffs, with 1.4 percent at WSDOT.
- Most state DOTs and many local governments contract with the private sector for maintenance due to staff needs and to realize economic benefits. State DOTs contract 0 to 35 percent of routine maintenance. WSDOT contracts approximately 1.9 percent of routine maintenance because it is prohibited by law from contracting work that is customarily done by state employees.
- The ratio of lane miles per state DOT maintenance field employee ranges from 9.3 to 33.2, with 12.3 in Washington. Washington's somewhat lower ratio of lane miles per employee is due, in part, to such factors as: the low percentage of work contracted out and its high percentage of urban traffic.
- Six of the 14 responding states said that they have a specific revolving fund for equipment similar to the Transportation Equipment Fund.

E. Level of Service Approach

This study has pioneered a new approach to measuring what is actually accomplished in maintenance and in giving decision makers an understanding of policy alternatives and budget tradeoffs. The technical work in this study was extensive and is documented in the two volume report. The methodology developed in this study links budgetary needs with different maintenance levels of service or quality. Five maintenance levels of service were established, each representing excellent "A", to failing conditions "F". These "A-F" ratings correspond to the "1-5" ratings used during the public involvement effort. Levels of service were measured for individual maintenance activities, such as repair of potholes, traffic signals, and drainage facilities. Exhibit E-2 depicts alternative levels of service for one maintenance element; "drainage".

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Exhibit E-2

Level of Maintenance Service: Drainage

CONDITION 1



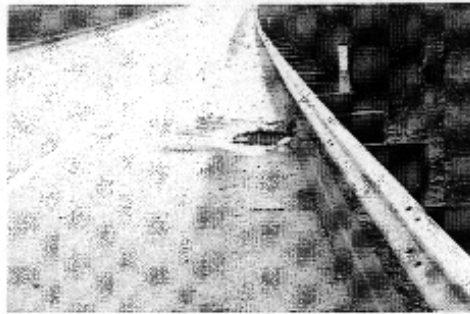
ROADSIDE STORM DRAIN FREE OF ANY BLOCKAGES, SILT BUILD UP, BRANCHES, OR OTHER DEBRIS.

CONDITION 2



ROADSIDE STORM DRAIN WITH SOME AREAS OF STANDING WATER.

CONDITION 3



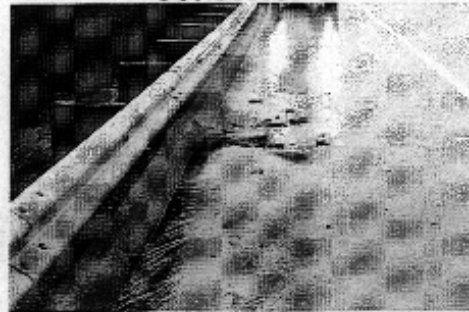
ROADSIDE STORM DRAIN WITH SOME SILT AND ROCK BUILD UP, OCCASIONAL LITTER, SMALL TWIGS OR BRANCHES, AND SOME STANDING WATER.

CONDITION 4



ROADSIDE STORM DRAIN PARTIALLY OBSTRUCTED WITH SMALL BRANCHES, TRASH, AND CONSIDERABLE STANDING WATER.

CONDITION 5



ROADSIDE STORM DRAIN WITH SILT AND ROCK ACCUMULATION AND LITTER AND BRANCHES IN THE DRAIN CAUSING PARTIAL OR COMPLETE BLOCKAGE.

Statistically significant data was gathered concerning the WSDOT highway system to determine the existing maintenance level of service. Preliminary estimates were made of the resources associated with different maintenance levels of service. It should be noted that investment in maintenance and the level of service is directly related to investment in the preservation program. Over time, less investment in one program will increase demands in the other. Key findings and recommendations include:

- WSDOT currently spends \$115,903,000 annually to provide an overall maintenance level of service that is between a B and a C. This rating varies for each component of the highway system with ratings ranging from A to F. Exhibit E-3 below illustrates how the WSDOT maintenance level of service has been identified for different maintenance elements.
- Preliminary cost estimates have been made for achieving different levels of service and these are currently being refined by further WSDOT analysis.

Exhibit E-3
Illustration of WSDOT Level of Service Measurement

Maintenance Element	Quality Measure (Per 0.1 Mile)	Current WSDOT Level of Service				
		A	B	C	D	F
ASPHALT PAVEMENT						
Potholes	No. of Unfilled Potholes/Per Lane	0	.05	.25	.5	> .5
Cracking	Linear Feet of Unfilled Cracks/Per Lane	0	50	200	400	> 400
ROADSIDE						
Vegetation	Average Height of Grass	4	8	12	16	> 16
Litter & Debris	Volume of Litter (No. of Items)	0	10	20	40	> 40
Brush & Tree Control	Linear Feet Defective	0	5	15	30	> 30
TRAFFIC CONTROL & SAFETY						
Signs	Percent of Signs Defective	0	5	10	15	> 15
Signals	Percent of Signals Malfunctioning	0	.05	.1	.2	> .2

■ Indicates the current WSDOT Level of Service.

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F. Resource Assessment

WSDOT should adopt a standards-based work program approach to determine resource requirements. Preliminary resource estimates were developed and will be refined by the WSDOT over time. Key findings and recommendations include:

- The overall maintenance (M2) field staffing (FTE) level is reasonable, although some efficiencies are possible.
- WSDOT should utilize both full-time personnel and temporary employees in a manner that maximizes the cost-effectiveness of maintenance operations, allows for the provision of essential services, and enhances the safety of the traveling public.
- There is strong evidence that there are significant benefits to private sector contracting of maintenance. WSDOT should have expanded ability to contract for routine maintenance. These benefits include: cost savings, increased quality, and greater flexibility to cover peak workloads. Because of statutory limitations, the WSDOT currently contracts only 1.9 percent of its routine maintenance, significantly less than some states.
- The \$30,000 limit on WSDOT performing project work may artificially limit more cost-effective in-house alternatives.
- There is potential for achieving efficiencies in the implementation of the Maintenance Accountability Process. Savings as a result of these efficiencies may be needed to cover cost increases for system expansion or increasing the level of service.
- Equipment appears standardized to a large extent at WSDOT and appears to be replaced at a reasonable age. The fleet size is generally acceptable.
- The Transportation Equipment Fund is using sound management and operational approaches, including promoting the use of advanced technologies.
- The revolving fund approach to equipment funding is viable.
- The WSDOT should establish key indicators of Transportation Equipment Fund efficiency and effectiveness for reporting to the Legislature.

G. Organizational Assessment

The study assessed the organizational structure of the WSDOT maintenance function at the Olympia Service Center, regions, and areas. Key findings and recommendations include:

- Policy development is centralized at the Olympia Service Center.
- Policy implementation and service delivery are primarily the responsibilities of WSDOT regions, areas, and sheds, although the Olympia Service Center provides direction and technical assistance.

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- The current WSDOT organizational structure can be effective in implementing policy if the Maintenance Accountability Process with its focus on measurable performance is put into effect.
- In order for the Maintenance Accountability Process to be successful, there need to be the right incentives, including use of performance measures for budgeting, rewarding employee performance, providing top management support, and involving staff in designing new performance-based processes.
- Policy focus should be on what is accomplished (performance outcomes). WSDOT regions should be given flexibility to determine how maintenance service is to be provided.
- The Olympia Service Center staff should provide independent validation of maintenance performance results.

H. Implementation Plan

The implementation plan details the organizational responsibilities, tasks, timing, and resources necessary to introduce and operationalize the new approach to maintenance at WSDOT, the Maintenance Accountability Process.

Short term implementation strategies include:

- Immediately implement tools and information developed in the study for preparation, review, and processing of the 97-99 maintenance program budget.
- Initiate field data collection for outcome-based performance measures as a standard practice in WSDOT Maintenance.
- Orient and train WSDOT personnel on the Maintenance Accountability Process.
- Initiate discussions with policy makers regarding changes to state law governing contracting out routine maintenance and equipment repair.
- Complete the automated shop work order system.

Long term implementation strategies include:

- Continuously improve the initial working components of the maintenance level of service approach.
- Purchase and implement maintenance management software.
- Expand the inventory of infrastructure maintained by the WSDOT.
- Conduct a pilot project to assess in-house vs. contracted maintenance.
- Update public involvement information.

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I. Conclusion

The Maintenance Accountability Process will launch a new era for maintenance in Washington. It provides the approach and tools to support a more enlightened debate about desired levels of service involving the public, public officials and transportation personnel. It can help WSDOT deliver quality maintenance service. Implementation will result in a well-maintained transportation system that is a source of pride for Washington.